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Adopt a Stream workbook

How to Protect Your Favorite River, Stream or Brook

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ADOPT-A-STREAM PROGRAM
Massachusetts Department of Fisheries, Wildlife &
Environmental Law Enforcement

John C. Phillips *Commissioner*	Trudy Coxe *Secretary*	Argeo Paul Cellucci *Governor*

An Agency of the Executive Office of Environmental Affairs

Adopt a Stream workbook

Second Printing, 1998
Second Edition, 1992
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Commonwealth of Massachusetts
Department of Fisheries, Wildlife &
Environmental Law Enforcement
John C. Phillips, *Commissioner* (617) 727-1614

March 31, 1998

Dear Friend of Rivers:

The mission of the Riverways and Adopt-A-Stream Programs is to promote the restoration and protection of the ecological integrity of the Commonwealth's rivers, streams and adjacent lands. The Riverways and Adopt-A-Stream Programs were established within the Department of Fisheries, Wildlife and Environmental Law Enforcement in 1987 in recognition that river and stream corridors are a crucial component of the state's ecology. The programs were created to encourage and support local river protection initiatives as a vital complement to state action.

This updated **Adopt-A-Stream Workbook** will make it easier for all concerned citizens of Massachusetts to take actions to protect and restore the Commonwealth's natural resources. At the same time as the pressures on our open space, waterways and biological ecosystems are increasing, state funds for the protection of these resources are decreasing. Thus it has become even more vital for citizens to get involved in the protection and management of natural resources.

The Department of Fisheries, Wildlife and Environmental Law Enforcement believes that when individuals come together and pool their talents and varied resources, they can be the deciding factor in protecting rivers, streams and adjacent riparian lands. This Adopt-A-Stream Workbook and the Riverways and Adopt-A-Stream Programs are here to support local community efforts to protect rivers. Together we can set goals, achieve objectives and take steps in establishing green corridors to promote clean rivers throughout the Commonwealth. We expect to see tangible benefits each year as we increase the number of miles of rivers protected and the percent of water achieving Class B or better ratings.

We hope you will put your enthusiasm and energy into the protection of local rivers, brooks and streams. By working together across the Commonwealth, we will do our parts to protect Massachusetts rivers for today and for the future.

Sincerely,

John C. Phillips
Commissioner

100 Cambridge Street • Room 1901 • Boston, Massachusetts 02202
An Agency of the Executive Office of Environmental Affairs, Trudy Coxe, *Secretary*

How to Use the Adopt-A-Stream Workbook

The Adopt-A-Stream Workbook is designed to help you and your group protect the rivers, streams and brooks across the Commonwealth. The workbook begins with a map of the watersheds. Look to find your watershed address and see how your river fits in with the other watersheds in Massachusetts. Accompanying the map, a River Protection Flow Chart sums up the vision, goals, objectives and actions which are the underpinnings of effective river protection.

The workbook itself is divided into three parts:

- Part I, the background section, describes the Adopt-A-Stream vision and procedures for adoption; current federal, state and local laws and governmental agencies; and a summary of the issues.
- Part II, the action section, describes eight key steps to help groups get organized, gather information and take action.
- Part III, the resources section, lists worksheets which will help you with projects including "How to Adopt-A-Stream," land mapping information, unusual colors and odors in water, how to report pollution, land protection techniques, river clean ups and visual surveys. The section also contains a listing of resources for further reading.

Some folks have found it helpful to peruse the entire workbook to gain an overall view of possible work to protect rivers. Others prefer to read it as projects occur, in a step-by- step manner. We hope that however you use it, you will find it useful.

Please feel free to photocopy the pages as needed for your work and to share with your associates in river protection.

We encourage you to call the staff of the Riverways and Adopt-A-Stream Programs so that we can work together to protect your river or stream.

Riverways Coordinator
Adopt-A-Stream Coordinator
Rivers Advocate
Stream Ecologist

Riverways and Adopt-A-Stream Programs
DFWELE
100 Cambridge Street, Room 1901
Boston, MA 02202
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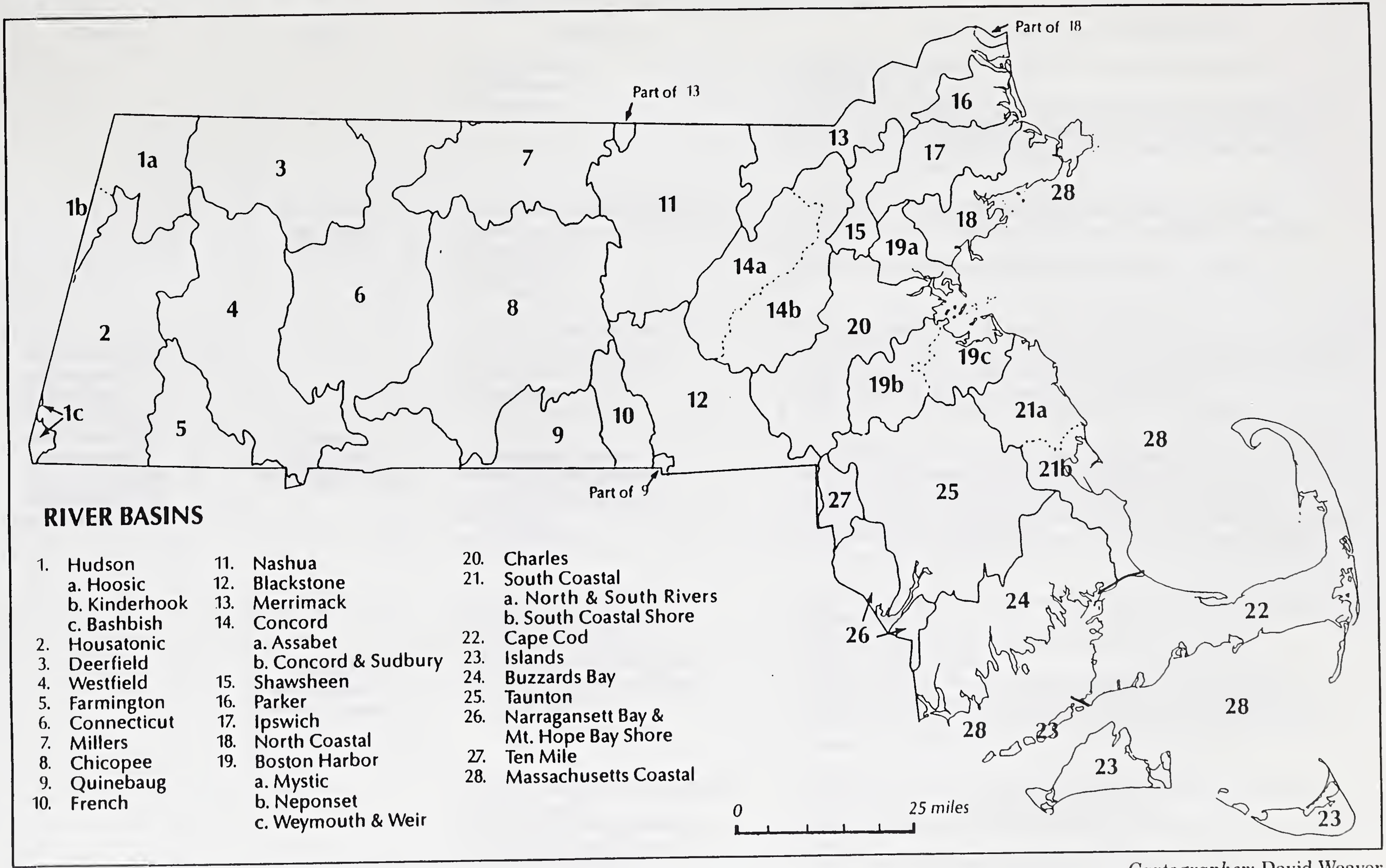
Watersheds of Massachusetts



RIVER BASINS

1. Hudson
   a. Hoosic
   b. Kinderhook
   c. Bashbish
2. Housatonic
3. Deerfield
4. Westfield
5. Farmington
6. Connecticut
7. Millers
8. Chicopee
9. Quinebaug
10. French
11. Nashua
12. Blackstone
13. Merrimack
14. Concord
   a. Assabet
   b. Concord & Sudbury
15. Shawsheen
16. Parker
17. Ipswich
18. North Coastal
19. Boston Harbor
   a. Mystic
   b. Neponset
   c. Weymouth & Weir
20. Charles
21. South Coastal
   a. North & South Rivers
   b. South Coastal Shore
22. Cape Cod
23. Islands
24. Buzzards Bay
25. Taunton
26. Narragansett Bay & Mt. Hope Bay Shore
27. Ten Mile
28. Massachusetts Coastal

Cartographer: David Weaver

Base map: U.S. Department of Agriculture, Soil Conservation Service from U.S. Geological Survey maps, 1:250,000 Series.

ADOPT-A-STREAM PROGRAM

River Protection Flow Chart

Vision	Goals	Objectives	Actions (Specific and measurable)
A network of ecologically sound and scenic riparian corridors with clean water, protected lands and protected instream flows	**Clean Water (at least Class B)**	■ Identification ■ Abatement ■ Protection	1. DEVELOP or OBTAIN reduction through point source pollution profile 2. DEVELOP or OBTAIN point source abatement/prevention plan 3. ADVOCATE and MONITOR implementation of plan in #2 4. MONITOR and ADVOCATE proper treatment plant operation and maintenance
		Nonpoint source pollution reduction through ■ Identification ■ Abatement ■ Protection	1. DEVELOP or OBTAIN nonpoint source pollution profile 2. DEVELOP or OBTAIN nonpoint source abatement/prevention plan 3. ADVOCATE and MONITOR implementation of plan in #2
	Protected Riparian Corridor Lands	**Land Protection** through: ■ Owner and use maps ■ Landowner contact ■ Landowner involvement	1. MAP and IDENTIFY landowners and land use 2. CONTACT landowners and NEGOTIATE for protection through fee simple, conservation restriction or other means 3. ENCOURAGE voluntary habitat improvement 4. OBTAIN (or LOBBY for) funding for land protection
		Strengthen Local Government Land Use and Environmental: ■ Policies ■ Regulations	1. ANALYZE and rate adequacy of local government environmental protection efforts (zoning, bylaws, regulations, etc.) 2. REVIEW local environmental protection throughout the watershed and COMPARE inconsistencies and cumulative impacts 3. ADVOCATE for implementation of effective local government environmental protection
	Protected flow patterns and volumes	**Protect rivers' free-flowing nature** through: ■ Dam I.D./evaluation ■ Dam modification/removal ■ Promotion of alternatives to new dams	1. IDENTIFY current and proposed dams, channelizations and similar projects 2. EVALUATE current and/or potential environmental impact of these facilities 3. ADVOCATE modifications and/or alternatives to proposed facilities which have a significant negative environmental impact 4. ADVOCATE remedial action for degrading activities/facilities already in operation
		Protect adequate instream flows through: ■ I.D. withdrawals/diversions ■ Proposing alternatives, e.g., conservation ■ Protecting sensitive areas from damage	1. IDENTIFY current and proposed withdrawals, diversions and sensitive areas/resources needing protection; 2. EVALUATE current and/or potential environmental impact of these facilities 3. ADVOCATE modifications and/or alternatives to proposed facilities deemed to have a significant negative environmental impact 4. ADVOCATE remedial action for degrading activities/facilities already in operation & Prevention

Workbook

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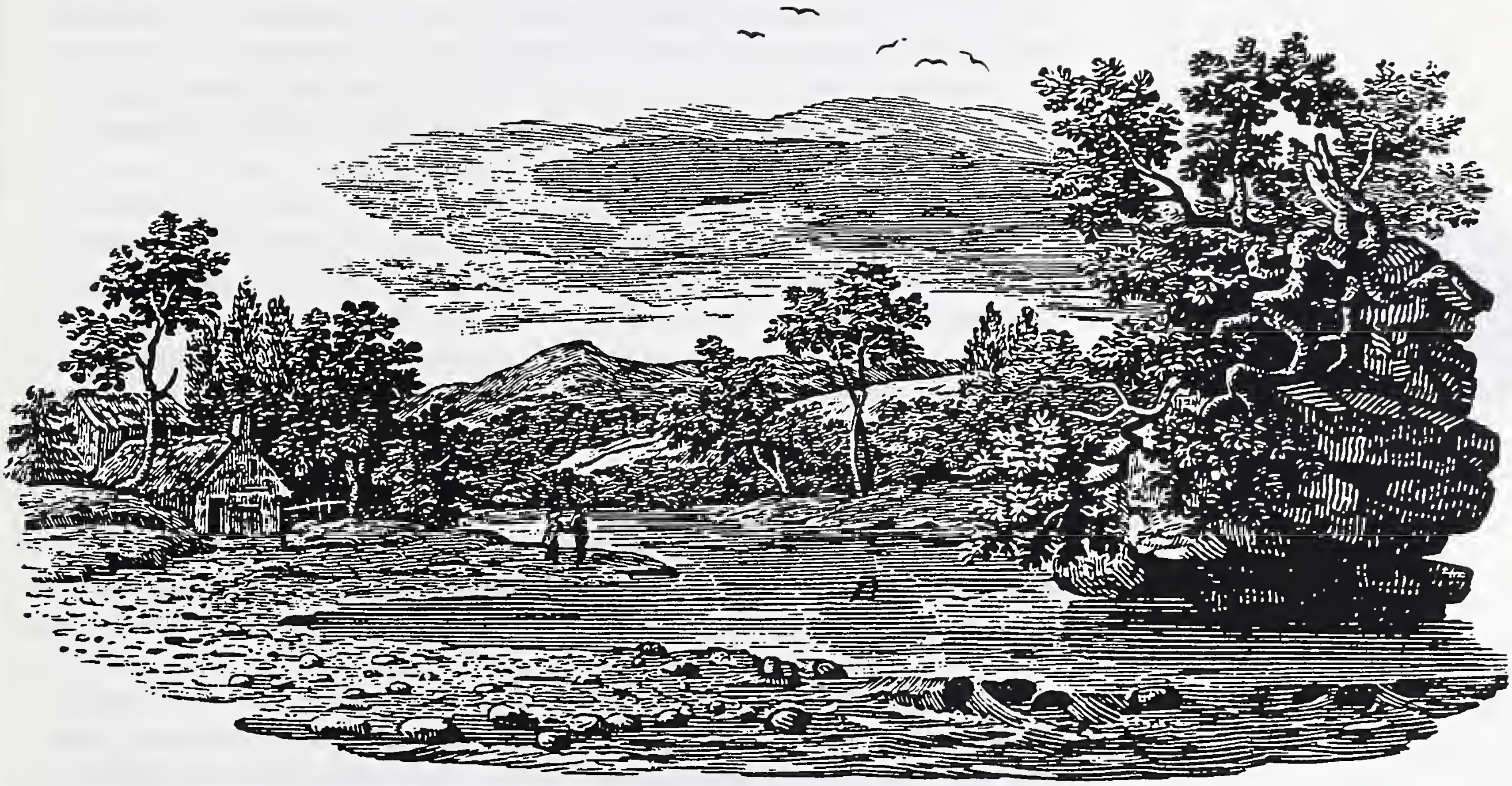
PART I



Background Information

- Introduction
- The Adopt-A-Stream Vision
- Goals of the Program
- The Law, the Regulators and Home Rule
- Issues
  Water Quality
  Water Quantity
  Land

Introduction

This **Adopt-A-Stream Workbook** is designed as a workbook because saving rivers and streams is hard work. But working with your neighbors to protect the water resources in your community can be tremendously satisfying, and, in the end, can secure a lasting legacy of clean water and natural open spaces in which wildlife and people alike can find refuge and take pleasure.

The **Adopt-A-Stream Program,** one of the Riverways Programs of the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement (DFWELE), is being offered to the public in the belief that local initiative is the key to protecting water resources and natural wildlife habitat in the state.

There is no doubt that the Commonwealth's rivers and streams need protection. Whether they are pristine and need protection to stay that way, or they are overburdened with pollution and physical alterations and require clean-up and relief from development, Massachusetts rivers and streams need supporters and advocates.

Since the early settlers arrived in New England, the rivers and streams have been a vital force in the local community, driving the economy with power for mills and presses; providing drinking water; offering transport for people and goods; replenishing the fertile lands for agriculture; yielding fish, shellfish and other foods; and always, serving as the waste disposal system for individual households, towns, and industries.

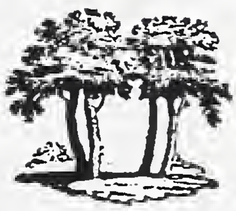
Not long after the first settlers began to establish a foothold in Massachusetts, the rivers began to suffer from the land clearing, construction and development along their banks as a result of using the water for power and processing. Use of the water resources for waste disposal changed the chemical and biological status of rivers, their tributaries and related ponds and lakes. As early as 1663, town records on the Assabet River in eastern Massachusetts indicate that the pollutants from flax processing were found to be poisoning cattle drinking from the river. The Commonwealth's rivers and streams continue to suffer from over-burdened waste treatment facilities, industrial pollutants and a variety of other direct and indirect pollution.

Progress has been made, to be sure, particularly in the past twenty years since the passage of the original national Clean Water Act (in 1972) and with the growing awareness of the impacts of environmental degradation. As the public began to understand more clearly the intimate connections between surface waters in lakes, streams and ponds, groundwater beneath the soils, and wetlands (whether inland low-lying areas or prolific coastal marshes and estuaries) there has been an increased demand for cleaner water and greater preventive action to stop destruction of natural water systems. While the state has made great strides in monitoring pollution and regulating discharges, it has often been local people who have been the driving force behind water resource protection, particularly preventing further pollution.

Citizen initiative and on-going involvement is crucial for two central reasons. First, people cause most pollution. People must therefore make some of the complex decisions about the tradeoffs between certain types of development and clean, safe water supplies. Second, in Massachusetts, there is a strong and longheld tradition of "home rule" which gives local governments many more powers to regulate and control local situations than state government. While state government can enact "enabling" legislation, it is local city governments or town meetings who must act to implement measures such as groundwater protection, zoning, development regulations, and wetlands protection. Without the guidance, cooperation, and persistence of citizens who care about water resources and natural open spaces, many of the possible protection measures will not be utilized until after these resources become so depleted or polluted that the process of clean-up and restoration is difficult, costly and sometimes hardly possible.

Massachusetts has an abundance of groups involved in the issues of clean water, land protection and environmental quality, some of them with many years of experience and excellent track records of solving related problems. In addition, there are a variety of excellent written and other resources available to people who want to get involved in river protection. This **Workbook** points out some of these resources with the intent of enabling people to take action in a community setting. The **Workbook** provides both specific contacts and a general approach for groups to take toward river protection. While the **Workbook** cannot provide an exhaustive review of relevant resources, it highlights what is available.

The goal of the **Adopt-A-Stream Program** is, simply, to help local people get involved in the protection of rivers and related open space lands. The purpose of this **Adopt-A-Stream Workbook** is to provide citizens who want to get involved with an overview of the action steps they can take. It is through the partnership of local citizens, local government, the private sector and state government that the goals of clean waters, natural open spaces and healthy ecosystems can be realized.



The Adopt-A-Stream Vision

Massachusetts is blessed with bountiful water resources. The Commonwealth has 10,000 river miles, of which almost 1,700 miles are major rivers. In the past fifteen years significant clean-up efforts have brought about 48% of these waters up to the water quality standards which allow their designated uses. The three major categories by which water quality is classified are:

Class A: Drinking water

Class B: Fishable and swimmable

Class C: Secondary contact (boating)

But more than half the major river-miles in the state remain below their designated classification quality.

The lands along these waterways have in many cases been built up, often beyond the capacity of the natural ecosystem. Construction in wetlands and flood plains began to be regulated more carefully in the 1970's, but past development has reduced the amount and ability of wetlands to help manage flood waters or to recharge crucial groundwater systems. Current dramatic increases in property values are making it attractive for developers to use land that would have been considered marginal in years past because of poor drainage or proximity to flood or wetland areas. The resulting pressure means that a new round of changes in land use is taking place which has serious implications for both water resources and the scenic open spaces along water bodies.

Imagine the benefits to local cities and towns if a network of riparian lands can be created along major riverways and kept in a natural state for non-intrusive recreational use and wildlife habitat. These natural lands will afford not only scenic open space for human restoration and appreciation, but also protected habitat for wildlife. Moreover, these lands can provide a protective buffer for the water resources, advancing efforts to improve water quality, and can offer natural storage for high water conditions.

Water conservation is also vitally important to protecting the quality of our water. By conserving the amount of water we use, we are protecting the instream flow of our rivers, which is necessary to sustain healthy functioning aquatic ecosystems. When we waste water we use up current supplies and withdraw yet more water from rivers, streams and hydrologically connected resources. While some of this water is returned to groundwater and the streams, or to the streams directly by septic systems or wastewater treatment systems, this water is usually lowered in quality. Adequate flows are also necessary to effectively assimilate point and non-point pollution.

The vision which propels the **Adopt-A-Stream Program** encompasses a network of green corridors along rivers and streams; open space for human enjoyment and wildlife support; cleaner waters and habitat for fisheries and waterfowl; conservation of our precious water resources; in short, a mutually beneficial relationship between water resources and the people of the Commonwealth.

To participate in the Adopt-A-Stream Program, take these simple steps:

Review the Forms which describe how to join the Adopt-A-Stream Program included in Part III, Resources.

Fill out and return the simple survey forms

Contact the Adopt-A-Stream coordinator at (617) 727-1614 × 384 and formulate a scope of agreement.

Groups which join the program receive a certificate and support to carry out their objectives. See Part III, the *Resources* section for the "How to Adopt-A-Stream" worksheets.

The Goals of the Program

The **Adopt-A-Stream Program** has two main goals which together will help achieve the vision of natural riparian corridors along clean flowing rivers and streams. They are, in brief:

To help local groups protect riparian parcels of land in a natural state; and

To help local groups improve and maintain water quality and quantity in key rivers and streams to at least Class B (fishable and swimmable) quality, and to protect healthy instream flows.

These goals are obviously interconnected and complementary. Protecting land without improving water quality makes as little sense as improving water quality but allowing all adjacent lands to be built or utilized for incompatible uses. Particularly in areas with high-quality (Class A) water, maintenance and protection are crucial. By combining these two goals, groups working with their local governments, the **Adopt-A-Stream Program** and similar efforts, can help create healthy and productive habitat for wildlife, fish, birds, and plants.

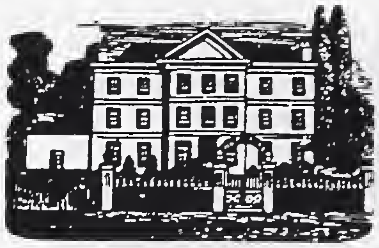
Protecting habitat corridors has some important effects on the overall ecosystem. First, linear corridors allow movement of species which is prevented when green space is limited to isolated, scattered sites. Second, natural reproduction and proliferation of species can more likely occur in varied, less disturbed environments. Riparian corridors are particularly valuable since they are highly productive areas for all sorts of plants and wildlife. Natural open space, used by the public in unintrusive or less concentrated styles, allows wildlife and flora to thrive in a less disrupted environment. These riparian corridors also serve as buffers to non-point source pollution. This sort of open space use, combined with efforts to improve water quality, is an important complement to the state's excellent system of parks and planned recreational areas.

This **Adopt-A-Stream Workbook** outlines a variety of actions through which you can accomplish these two goals, and realize the overall vision.

The Law, the Regulators and Home Rule

In 1972 the Massachusetts Constitution was amended to read:

The people shall have the right to clean air and water, freedom from excessive and unnecessary noise, and the natural, scenic, historic, and aesthetic qualities of their environment; and the protection of the people in their right to the conservation, development and utilization of the agricultural, mineral, forest, water, air and other natural resources is hereby declared to be a public purpose . . . (Article 97, Massachusetts Constitution).



This strong guarantee is supported by a variety of environmental agencies and laws. The rivers and riparian lands of the state are protected by several laws at the federal, state and local levels. Federal law is largely mandatory; state law is sometimes mandatory and sometimes framed as "enabling" legislation which provides a framework for local government to use if it decides to exercise the option. Because of the strong "home rule" tradition of local government, Massachusetts cities and towns also have a considerable range of powers which they may choose to utilize.

The laws are enforced by government agencies at the national, state and local levels as well. These regulators are charged with monitoring compliance with environmental legislation or regulations and taking enforcement action if necessary.

One of the difficulties with achieving uniform protection of natural resources such as rivers or open space is that "home rule" operates as though there were 351 autonomous environmental protection agencies across the state-each town and city has the ability to regulate, but may not choose to do so beyond the specific requirements of state and federal laws. On the other hand, local governments may adopt bylaws and regulations more restrictive than those required by state or federal law. This structure invites local involvement: people concerned about rivers and related environmental resources can educate, inform and activate local officials to utilize their powers.

The federal and state laws most pertinent to protecting rivers and related resources, along with the agencies which administer and enforce the law and related regulations, are summarized briefly in the following sections.

FEDERAL LAWS

THE CLEAN WATER ACT

Four major federal statutes provide the framework for **river** protection and shape related state and local laws. The law with perhaps the greatest impact on water quality is Public Law 92-500 of 1972, generally known as the **Clean Water Act** which was passed in order to restore and maintain the chemical, physical and biological integrity of the nation's waters. This law, amended and passed in Congress in early 1987 over the President's veto, is up for reauthorization in 1992.

In its original version, the message was simple—there shall be no unlawful discharge of pollution to U.S. waters. The law established uniform standards for water quality in rivers, streams and other surface water and mandated sweeping federal and state efforts to clean up rivers and lakes by preventing and eliminating pollution. The two major and highly ambitious goals of the law were to:

1. *Achieve Class B water* (which is clean enough for swimming, other recreational uses, and the protection and propagation of fish, shellfish and wildlife) wherever possible by July 1, 1983; and

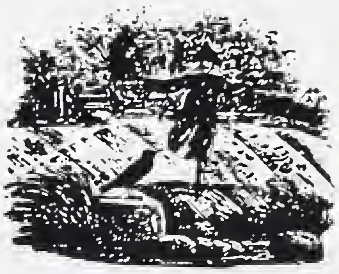
2. *Achieve zero discharges of pollutants into the nation's waters by 1985.*

To do this, the law provides for a broad testing, monitoring and permitting process. Permits are required for any discharges into rivers and lakes from "point sources" whether municipal wastewater treatment plants, industries or commercial establishments, agricultural facilities or any other source that releases pollutants through outfall pipes, sewers or similar conduits.

The permitting is handled through the National Pollutant Discharge Elimination System (NPDES) through which permits to discharge are issued on *the condition* that sources comply with a schedule to reduce pollutants over a specified period of time. Effluent monitoring and reporting are required by the permit. There are serious penalties under this law (and its state counterpart, described below) for failure to comply with the permit system.

In addition, the original Clean Water Act provided for extensive regional planning and management efforts including the development of long-range pollution control plans and major funding for the construction of wastewater treatment plants. Another important provision of the Act is for citizen suits in cases where citizens have evidence that state and federal officials are not enforcing compliance with the law by private or municipal dischargers.

In the first decade after the Clean Water Act was passed, when the nation's population grew by 11 percent and water use by industry and recreation increased, significant progress was made. It is estimated that 47,000 stream miles improved in quality (a distance equal to twice around the world), 390,000 acres of lakes (an area twice the size of New York City) improved in quality and 142 million people received secondary or more advanced levels of sewage treatment—a 67 percent increase.



The most recent amendments to the Act in 1987 brought sweeping changes. While its scope was broadened from controlling municipal sewage and industrial wastewater discharges to include specific requirements for non-point source and toxic pollution reduction, the federal role in funding and implementing a comprehensive cleanup strategy was sharply limited, shifting responsibility to state and local governments.

States are required to develop management plans and strategies to reduce pollution from non-point sources rather than rely on federally developed pollution control guidelines. Certain industrial and municipal stormwater discharges now require NPDES permits.

The federal grants program that funded municipal wastewater treatment plant construction was phased out and replaced with a revolving loan fund to be administered by the states. Because of a drastic reduction in financial support, many municipalities must seek new sources of funds for construction projects.

Needless to say, the goals of the original Clean Water Act have not been fully reached. Major strides have been made, but in Massachusetts more than half the river miles have not yet reached their designated water quality classification. The question remains how cities and towns will comply with national and state goals for clean water.

Twenty years since its passage and five years since the last revision, the Clean Water Act is undergoing congressional reauthorization in 1992. Pollution prevention and industrial pretreatment, compliance and enforcement, combined sewer overflow abatement, funding for pollution control projects and stormwater permitting programs, and wetlands protection are among the issues to be addressed.

The other important pieces of federal legislation for river protection include the **Safe Drinking Water Act,** the **Rivers and Harbors Act of 1899,** and the **National Flood Insurance Program.**

The **National Wild and Scenic Rivers Act** can also provide a measure of protection in certain cases.

THE SAFE DRINKING WATER ACT

The Safe Drinking Water Act was originally passed in 1974 (Public Law 93-523), and was amended in 1986 to stiffen the actions which may be taken by the Environmental Protection Agency to protect drinking water supplies. The act regulates toxins, chemicals and other substances which endanger drinking water in surface sources. To protect surface water supplies, the Act requires extensive water quality monitoring, watershed land-use controls and, often, construction of filtration facilities. It also covers groundwater (nearly half of all Americans obtain their water from a groundwater source) by protecting sole source aquifers or those which are the primary source of municipal water supplies and wellheads (the areas that recharge wells). The act also regulates underground injection of wastes into soil. Funds are provided for planning and implementation of this act, including the development of comprehensive protection plans via land use controls.

THE RIVERS AND HARBORS ACT OF 1899

The Rivers and Harbors Act of 1899 authorizes the United States Corps of Engineers to prevent obstruction of navigable waterways and also regulates the discharge of refuse into these waters. The same legislation regulates dam and dike construction and establishes the boundaries of harbors. All navigable waters are covered including waters once used for interstate or international commerce. (In related responsibilities, the Corps of Engineers is charged with issuing permits for discharge of dredge or fill into navigable waters. Section 404 of the Clean Waters Act.)

THE NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program provides flood insurance coverage to landowners in flood-prone areas where towns have complied with federal guidelines for mapping and adoption of local flood plain zoning protection.

THE NATIONAL WILD AND SCENIC RIVERS ACT

The National Wild and Scenic Rivers Act (Public Law 95-542 as amended) specifies a process by which Congress can designate a river as a national resource. There are two avenues which may be taken in order to authorize a **study** to determine whether a river would be suitable for inclusion in the National Wild & Scenic River System. Both require that such a request originate in the local communities. However, a community can either make a request to Congress to initiate a study (which then involves the National Park Service) or, if a river is already included in a state protection program, a local community can make a request to the Secretary of the Interior (through their governor) to conduct a study. Using the latter method, the National Park Service may become involved without congressional authorization. Rivers under consideration for Wild and Scenic status are protected from federally assisted water resource projects which would have a "direct and adverse effect on the river's outstanding resources" for up to three years after a report is sent to Congress.

MASSACHUSETTS LAWS

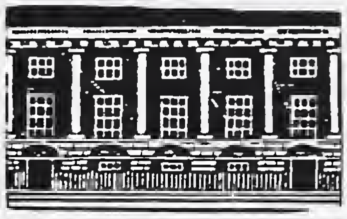
MASSACHUSETTS CLEAN WATER ACT

The Massachusetts legislature has passed a variety of laws related to river protection, water resources and related open spaces. Chief among these laws is the Massachusetts Clean Water Act (Chapter 21, section 43), a counterpart to the federal legislation. This law makes provisions for the state to help administer the national permitting system; to test and monitor for water pollution; and hold polluters accountable for point source discharges. It also requires permits for discharges into groundwater, an important extension of the federal law.

INTERBASIN TRANSFER ACT

WATER MANAGEMENT ACT

Two Massachusetts laws which have a direct bearing on water **quantity** issues are the Interbasin Transfer Act (IBTA) (Chapter 21 Sections 8B–8D) and the Water Management Act (WMA) (Chapter 21G). The purpose of the IBTA is to help ensure that proposed transfers of water (or wastewater) from one river basin to another meet a set of stringent criteria, including a finding that the proposed transfer is necessary and that a **reasonable instream flow** will be maintained in any affected rivers/streams in the donor basin. The WMA seeks to ensure that proposed new consumptive water withdrawals above 100,000 gallons per day are not permitted unless they do not exceed the "safe yield" of a particular river basin or negatively impact existing users, water-dependent ecosystems or other sensitive resources. The Department of Environmental Management's Office of Water Resources (DEM/OWR) administers the IBTA, while the Department of Environmental Protection's Water Management Program (DEP/WMP) administers the WMA.



One way for Adopt-A-Stream groups and other resource protection advocates to get involved directly in the water resources decision making process is to review and comment on any WMA permit applications for proposed withdrawals within a particular basin. DEP/WMP procedures call for copies of these applications to be mailed to town halls and allow a reasonable period for public comment. One significant drawback, however, is that permit applications are typically incomplete at this phase, and key information (such as a drawdown analysis) needed to determine the potential impact of a proposed withdrawal on adjacent water-dependent organisms and ecosystems is often missing. This information is often not supplied to DEP/WMP until just a short time before the deadline for ruling on the application and well after the public comment period has expired. DEP/WMP staff are nevertheless interested in receiving comments from public and private interests. A prompt request on your part for more detailed information on a particular withdrawal proposal should help ensure that the necessary data is generated and submitted in timely fashion.

To learn more about the relationship between water withdrawals/ diversions and ecological integrity, read an essay prepared in January 1992 and entitled *Water Supply Development vs. River Protection: The Case for Water Conservation.* For more information on the value and feasibility of water conservation initiatives, read a working paper from June, 1990 entitled *Conservation Works: The Ecological and Economic Benefits of Conserving Water.* Both documents were prepared by and are available from the Riverways Program (see Part III, *Resources*).

WATER RESOURCES COMMISSION

The Massachusetts Water Resources Commission (WRC) is charged (under Chapter 21A Section 8B et seq.) with overall oversight responsibility over all state laws and policies relating to water resources planning and management. One of the WRC's key responsibilities regarding rivers is the review and approval of water resources management plans (also known as **river basin plans**) submitted by DEM/OWR for each of the Commonwealth's twenty-seven major river basins.

WETLANDS PROTECTION ACT

Another important piece of state legislation is the Wetlands Protection Act which prohibits dredging, filling or otherwise altering wetlands without obtaining a permit which assures no more than minimal damage. The Wetlands Protection Act relies on local enforcement to a large degree through municipal Conservation Commissions.

WETLANDS CONSERVANCY PROGRAM

The Wetlands Conservancy Program (DEP) is producing highly accurate photo-based maps that inventory wetlands. These maps at a scale of 1:5000, or 1 inch equals 417 feet, show all the geographical detail and man-made structures as seen from the air. Wetlands are delineated using photointerpretation. Twenty percent of the state is currently mapped with more being completed as part of a continuing plan.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

The Inland Areas of Critical Environmental Concern designation (ACEC, Chapter 21 A, Section 2 (7)) requires state environmental agencies to take actions, administer programs, and revise regulations to preserve, restore or enhance resources. Some state projects and private development proposed within ACEC boundaries must undergo more careful public review to minimize adverse impacts. On behalf of the Executive Office of Environmental Affairs, Department of Environmental Management staff work with private citizens, communities, environmental organizations and other state agencies to document critical resources as part of the nomination process. A proposed Inland ACEC must contain a resource complex of statewide significance to become designated.

COASTAL ZONE MANAGEMENT ACT

MASSACHUSETTS ENVIRONMENTAL POLICY ACT

WATER QUALITY STANDARDS SEGMENT CLASSIFICATION ACT

SCENIC AND RECREATIONAL RIVERS ACT

Additional legislation of interest includes the Coastal Zone Management Act which provides oversight of changes in coastal areas; the Massachusetts Environmental Policy Act (Chapter 30, Sections 61 and 62) which provides a review procedure for certain construction projects requiring state permits; the Water Quality Standards Segment Classification Act (Chapter 21, Section 27); and the Scenic and Recreational Rivers Act (Chapter 21, Section 17A) which provides a process for state designation of rivers as having special scenic and recreational value.

THE WATERWAYS LICENSE AND PERMIT PROGRAM

The Waterways License and Permit Program (Chapter 91) was passed to protect public rights on great ponds, tidelands and some specified rivers and streams (such as the Merrimack, and portions of the Connecticut) through a system of permits and licenses.

THE REGULATORS

The agencies at the federal level which are responsible include the Environmental Protection Agency (EPA) and the Army Corps of Engineers (ACOE) as well as the Federal Emergency Management Agency (FEMA). At the state level, key agencies are the Department of Environmental Protection (DEP) which has four divisions specifically working on water quality issues; the Department of Environmental Management (DEM) which has divisions working on the Federal Flood Control Program and the Scenic Rivers and Corridor Planning; the Department of Food and Agriculture which regulates pesticide applications, runoff from farms and cranberry bogs; the Department of Fisheries Wildlife and Environmental Law Enforcement, through its Division of Marine Fisheries, its Division of Fisheries and Wildlife, its Division of Law Enforcement and its Public Access Board regulates the management of fisheries and wildlife, enforces all environmental statutes and regulations in the Commonwealth and regulates its public access facilities, and through the Division of Wildlife and Fisheries' Natural Heritage Program's regulations manage endangered species; and the Massachusetts Environmental Policy Act unit in the Office of the Secretary of Environmental Affairs which handles the MEPA review process.

Locally, one of the most important regulatory agencies is the Conservation Commission which has regulatory authority under the Wetlands Protection Act. It should be noted that local Boards of Health have broad powers to adopt regulations to protect the public health which may include river and groundwater protection. In addition, local planning commissions, local water supply officials (if any), sewer commissioners (if any), hazardous waste coordinators, and selectmen, city councilors, aldermen or city managers all have significant roles to play.

More details about agency responsibilities and the roles of various officials appear in the following tables.

HOME RULE

Given the extraordinary range of powers that may be implemented by local elected and appointed officials, "home rule" can provide very effective protection of natural resources. Still, many of the 351 cities and towns in the Commonwealth have yet to implement or effectively exercise their powers. The resistance to the imposition of state authority is a long-held tradition in New England. The resulting "home rule" approach to governance can lead to fragmentary, and even conflicting, actions by local towns on situations (such as river pollution) which clearly affect more than one town, originate in more than one jurisdiction and can only be resolved by cooperative action.

The home rule options place tremendous responsibility on town officials and, ultimately, on individual citizens who may need to educate, encourage, and hold officials accountable to their mandate. Cooperation among citizens and town officials, as well as between towns, is crucial to the achievement of clean rivers and protected open space. Home rule offers an enormous opportunity for citizen participation in this process of facilitating cooperation and action at the local level.

LOCAL POWERS

The duties and responsibilities of local officials are spelled out in the tables below. Most of their powers, as described, are optional.

Selectmen and Mayor/City Council/Aldermen/City Manager

- Can establish groundwater protection standards and practices for departments and boards under their jurisdiction and can require regular reports.
- Can appoint citizens concerned about groundwater protection to town boards and committees.
- Can place and support articles in the town meeting warrant to establish town bylaws for hazardous materials control, wetlands protection, earth removal, and the creation of a recycling commission.
- Can seek grants for aquifer acquisition, salt storage sheds, and other appropriate programs, when funds are available.
- Can administer town lands under their jurisdiction to protect groundwater.
- Can accept conservation restrictions for the municipality.
- May appoint a hazardous waste coordinator and provide official support for a hazardous waste management program.
- Can act to abate a nuisance that may be injurious to public health if the health board fails to act.
- May serve as the special permit granting authority.
- Can serve, in towns, as health boards, conservation commissions, and water and sewer commissions if separate boards have not been established by a vote of town meeting.

Powers set out in M.G.L. Ch. 41

Boards of Health

- Can hire an agent to enforce state and local laws and regulations.
- Can adopt regulations for any activity that might contaminate groundwater.
- Can regulate local use, transport, and storage of hazardous materials, including fuel (in cooperation with the Fire Dept.).
- May be able to limit use of herbicides and other chemicals over aquifers and recharge areas.
- Administer Title 5 (Environmental Health Code) governing installation and maintenance of on-site wastewater disposal systems. Check with DEP regarding revisions to Title 5 that change Board of Health authority and DEP review thresholds.
- Must approve plans for drainage in subdivision plans, can disapprove a subdivision plan or portion of a plan because of a threat to groundwater quality.
- Can require buildings that abut a sewer line to be hooked into it, even if they have septic systems.
- Must assign sites for "offensive trades," land-fills, garbage dumps, and hazardous waste disposal.
- Have broad power to regulate "nuisances," including those that threaten groundwater quality.

Conservation Commissions

- Can acquire conservation lands (with approval of chief elected officials (CEOs) including aquifers and recharge areas; can apply for state and federal funding for land acquisition (with CEO approval).
- Can purchase or acquire by gift conservation restrictions on land important for groundwater protection (approval of CEOs and the Executive Office of Environmental Affairs required); can also hold agricultural preservation restrictions.
- May receive gifts of land and money (CEOs' approval necessary).
- May establish regulations for use of land under its control; can include measures to protect groundwater.
- Can develop local bylaws to provide additional protection to wetlands (and the groundwater associates with them); bylaws must be passed by town meeting or city council.
- May serve as the permit agency for earth removal applications.
- Can provide environmental education activities to the public.

Additional Functions and Powers specified in M.G.L. c.40, S8C spelled out in M.G.L. Ch.131 S40 (Wetlands Protections Act). Must be established by town vote.

Local Water Supply Officials

- Are responsible for the development and maintenance of the public water-supply system.
- Set water rates; may set rates that cover all costs of delivery and encourage conservation.
- Can purchase or acquire by gift assigned to them by town meeting or city council.
- Must determine that the water supply meets state and federal drinking water standards.
- Can provide leadership for protection of aquifers and recharge areas.
- Can contract for studies to map and develop groundwater supplies.
- Can monitor quality of both water supplies and tributaries to supplies.
- Can urge CEOs to request DEP to declare a water emergency for the municipality; if emergency is declared, can restrict the use of water and declare a building moratorium.
- Can urge CEOs to apply for grants for leak detection and repair.
- Can provide leadership for water conservation.

Optional Group established by town meeting; duties specified in M.G.L Ch.41, S69B

Planning Boards

- Can plan for the "resources, possibilities, and needs" of the community, including groundwater protection; can develop a master plan and conduct other planning studies, including water-supply plans.
- Can serve as the special permit granting authority within zoning districts.
- Can develop and propose an official map governing the layout of roads and parks. (Protection of groundwater can be considered as the map is developed.)
- Must adopt regulations for reviewing subdivision plans and can include groundwater protection measures related to drainage, public ways, and public safety; can require extensive information about a proposed subdivision, including information about groundwater; may require construction bonds to ensure that drainage work is done properly.
- Must review all proposed zoning bylaws and amendments; can develop and recommend zoning and non-zoning provisions including site-plan-review bylaws, and environmental performance standards to control design of projects not covered by subdivision controls.

Powers specified in M.G.L Ch. 41

SOURCE: Local Authority for Groundwater Protection, Groundwater Information Flyer #4,
Massachusetts Audubon Society, July, 1984.

Zoning Board of Appeals

- Can hear and decide appeals from the application of the municipality zoning bylaw. Appeals can be heard from
  1) a person who has been unable to obtain a permit or enforcement action from any administrative officer
  2) the regional planning agency
  3) any person including an officer or board of the municipality or an abutting city or town who has been aggrieved by an order or decision of the building inspector or other administrative official, in violation of the zoning act
- Can hear and decide applications for special permits
- Can hear and decide petitions for variances
- Can hear and decide appeals from decisions of a zoning administrator (if any has been appointed).
- The Board of Appeals can grant relief from strict enforcement of the Zoning Bylaw in certain cases when such enforcement would constitute a hardship and when specific requirements are satisfied, can grant special permits.
- Persons aggrieved by a ruling of the Board of Appeals, may, within twenty days, appeal to the Superior Court.
- In a city, the Board of Appeals is appointed by the Mayor (with confirmation of the city council; and in a town, the Board is appointed by the Selectmen.

SOURCE: Powers specified in M.G.L. Ch 41 S81 Y, Z, AA, BB

NOTES

LOCAL OFFICIALS: Names and Telephone Numbers

Selectmen (or Mayor/City Council)

Planning Board Members

Conservation Commission

Board of Health

Local Water/Sewer Board

Zoning Board of Appeals

Recreation and Parks

Long Range Planning Committee

Board of Assessors (Chair)

Department of Public Works

Town Engineer

WATER QUALITY

The specific goals of the National and Massachusetts Clean Water Acts are clear. The responsibility in the Commonwealth is shared by state authorities (DEP) and the federal EPA for permitting and discharge regulation and local authorities for preventative measures related to land use, zoning and local environmental protection. But there are some hidden pressures which have made it difficult to achieve the goals for clean water.

First is the dwindling funding available from the federal government for regional land use planning and construction of sewage treatment facilities.

Second is the failure of rivers to meet water quality standards even after municipal and industrial wastewater treatment due to non-point source pollution. Many rivers and estuaries suffer degradation from a wide range of pollutants from diverse sources, including:

nutrients such as phosphorous and nitrogen from lawns, agriculture, storm water and septic systems which cause eutrophication, oxygen depletion, and possibly taste problems for those who depend on the river and adjacent wells for water supply;

heavy metals such as zinc and cadmium, oil, asbestos (from brake linings), anti-freeze from parking lot and street runoff; *bacteria and viruses* from failing septic systems, from agriculture and storm water;

herbicides and pesticides from agriculture and lawn care;

sediment from construction, agriculture or stream bank erosion which can smother fisheries and invertebrate habitat. Heavy metals and other toxics bond to sediment and thus they too find their way into our rivers.

In order to remediate and prevent degradation from non-point source pollution, coordination is needed between federal, state, regional and local transportation, agricultural, water quality, wetlands and planning authorities. While the Clean Water Act gives the Commonwealth a clear mandate to develop, implement and enforce strategies to prevent and control non-point source pollution, local advocates can press for land-use controls, erosion controls and use of stormwater "best management practices" or BMPs to improve water quality.

Third is the tremendous, and in many cases unanticipated, growth in parts of the Commonwealth. Population growth as well as location of new industrial facilities has stressed the capacity of many municipal sewage systems or added significant burdens to soils and groundwater in unsewered areas.

Fourth is the cumbersome process of determining need, then designing and constructing new treatment systems as well as the fiscal constraints on updating and maintaining systems. DEP estimates that it takes 12 years from the start of planning to the end of construction for a new wastewater treatment plant. The process is especially slow because the current state permits require municipalities to begin planning for expansion when the effluent discharge of the existing facility exceeds 80% of designed flow for 90 consecutive days. By the time this level has been reached, rapid growth can exceed 100% within months. It takes years to complete designs, locate funds (especially with staff and funding cutbacks at the state level over the past seven years) and then actually build a plant. By then, the level of pollution may have exceeded the original capacity for several years.

Without treatment facilities, growth can push pollution out of control (See Figure 1). If there is already a treatment facility but no planning, the municipality becomes locked into a hopeless cycle of

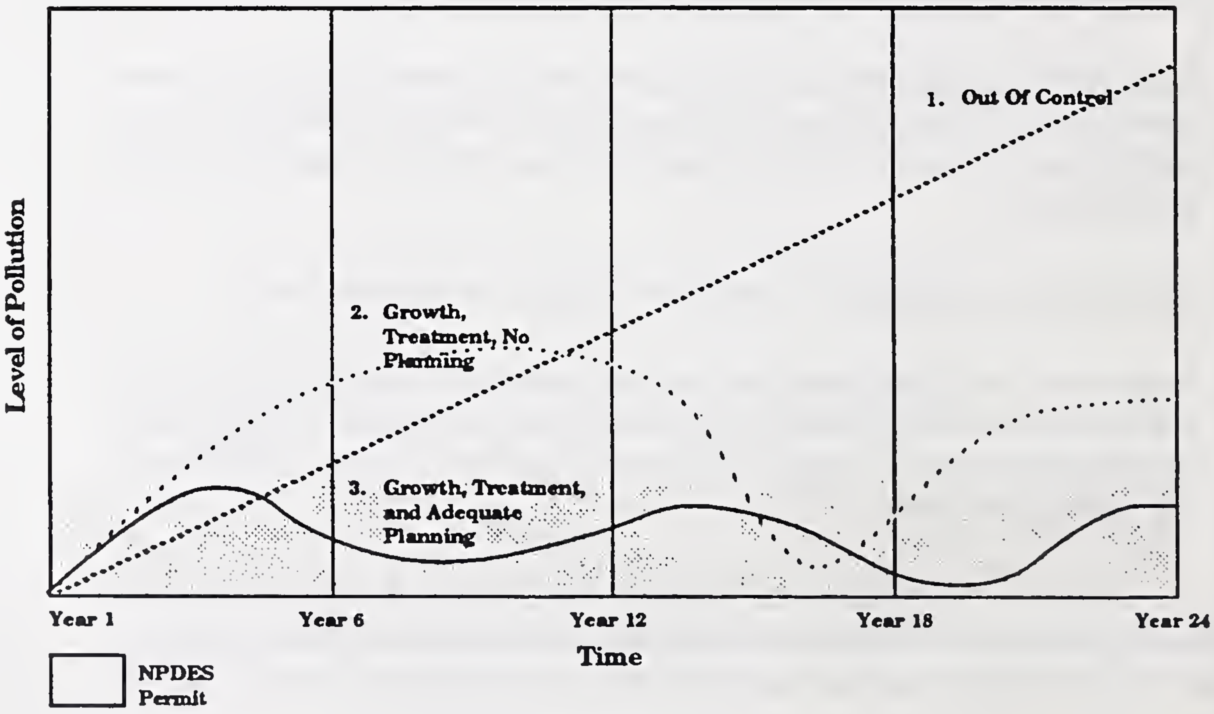


Figure 1.

pollution, brief improvement as a new facility is finally built and then rapid pollution again (See Figure 1). If a town or city has adequate planning (as the Clean Water Act envisioned) the planning process would anticipate the need for new capacity, and changes would be implemented before the permit levels were exceeded (See Figure 1).

This idealized process, however, relies entirely on the construction of sewage treatment plants. Other options are available. Planning could, for instance, include strict land use regulations to limit new sources of pollution, as well as creative and comprehensive water conservation and even water recycling programs. A leak detection program and metering of water use can make a dramatic difference in volume of water used; however, such programs require funds for infrastructure (pipes and other facilities) improvements. A combined sewer overflow plan to separate sewage and stormwater systems is similarly a capital-intensive alternative to expanded waste treatment in some situations.

Municipalities have for many years relied on subsidy based prices for water and sewer services. Communities are now supposed to charge users the full price for these services. Funds collected can be used to maintain or replace infrastructure such as wastewater treatment plants. To help communities meet these costs, Massachusetts has authorized the **State Revolving Fund** for new construction. The SRF is a loan program, not a grants program. To date, Massachusetts has authorized only funds necessary to match the federal seed monies provided by the 1987 Clean Water Act amendments. Financial resources are sorely needed for towns struggling with the costs of treatment plant construction or upgrading.

Increasing withdrawals for drinking water or other uses can have a negative impact on water quality or rivers in three ways:

First, consumptive withdrawals reduce the flow in rivers by directly pumping water, or by intercepting ground water that would otherwise end up in the river (or both). Less water in the river reduces its capacity to assimilate point and non-point source pollution.

Second, water that is used out-of-stream and is then returned to the river through treatment plants or septic tanks is usually poorer in quality than when it was originally withdrawn, also decreasing water quality.

Third, increased water use results in increased flows to wastewater treatment plants, making it harder for those plants to treat the influent effectively, exceeding plant capacity and increasing the likelihood of sewer overflows.

Water conservation by households, business and industry can significantly reduce overall water demand, thereby reducing wastewater treatment. With such additional conservation programs operative, a community may be able to prevent the need for major construction and, indeed, move toward actual improvement of water quality.

Local governments not only have the wherewithal to manage water supply and wastewater systems, but also the power to institute many local controls which can affect water quality. Land use controls through zoning or septic system (Title V) bylaws can be utilized to prevent and reduce pollution. In addition, many municipalities have developed industrial pretreatment or sludge management programs that require contaminants coming into the wastewater treatment plant to be reduced. This safeguards the treatment plant and the river or stream.

WATER QUANTITY

There is a widely held but erroneous belief in Massachusetts that, because of the relatively high levels of precipitation here, we are "water rich" and there is plenty of "excess" water available for human consumption, and therefore no need to use this water responsibly and efficiently. The truth of the matter is that the natural ecosystems of this state have evolved for thousands of years or more in reliance upon this relative abundance of water. Much of Massachusetts' flora and fauna is dependent upon maintaining naturally-occurring water levels in rivers, streams, vernal pools, wetlands and other aquatic ecosystems. Removing "excess" water from these water-dependent ecosystems can be as harmful to the water-dependent creatures there as more well-recognized forms of habitat alteration.

Although fish and other water-dependent species have evolved to withstand a certain level of stress resulting from naturally-occurring drought periods, artificially-induced drops in water levels caused by water withdrawals and/or diversions can significantly increase the duration, frequency and severity of drought conditions. This may lead to a marked decline in the quality and quantity of habitat for water-dependent species in rivers, streams, wetlands and other hydric ecosystems. Such an impact is likely to result in the demise of sensitive (and often the most ecologically significant) species, and a drop in overall species diversity, a key indicator of ecological health. This problem is further aggravated by the fact that new diversions or withdrawal points are often proposed to be located within the shrinking inventory of relatively unspoiled and uncontaminated areas which possess high ecological values and sensitivities.

Luckily, the environmental cost of additional withdrawals/diversions is largely if not totally **avoidable** in many situations. Most communities can do a much better job of delivering and using water in an efficient, cost-effective and environmentally responsible manner. Improving the efficiency of water delivery to, and use by, consumers can often close the gap between demand and existing supplies at a fraction of the cost of developing new sources. Efficiency improvements in water supply/use also bring with them a multitude of environmental benefits, including an enhanced ability to effectively treat wastewater and to retain water in the natural environment to perform its vital ecological functions. It should be kept in mind that whereas human communities can (and **should**) compensate for water shortages through more efficient use, the needs of natural communities are less flexible.

THE LAND

In any community, even the most remote and quiet town, there may be competing uses for a specific piece of land. In a rapid growth phase competition may appear acute. When the real estate market becomes inflated, with land prices rising and construction proceeding at a breakneck pace, land which would have been considered marginal in the recent past is being sought, bought and put into sometimes inappropriate uses. In times of recession there may be opportunities for planning for the next cycle of growth.

In most corners of the Commonwealth, such economic pressures have changed land use patterns. In the 1980s some communities reported growth spurts of more than 400%. Sleepy, small towns have doubled or tripled in size over a period as short as two years. While they are still not yet urban centers, these towns face unanticipated stresses on their soil and water resources as new construction brings additional roads (with increased runoff and salt/sand for snow control), septic tanks with leaching fields, and wells dug for water supply.

As the land scramble continues, parcels which have lain untouched for years are put on the market. Prices soar. Cities and towns which took for granted "open space" (which was land merely "underutilized" by current market standards) may be facing a sudden depletion of open land, plus prices so high that purchases by local governments are inhibited.

In addition to the current pressures on land, historic zoning and land use patterns continue to affect open space and water resources. Many communities need to re-evaluate their zoning plans, and consider where new development can best be located in light of updated open space plans and an inventory and assessment of the community's natural, cultural and historic resources. A variety of allowed land uses may be incompatible with the concurrent desire to preserve open space and water resources.

The combination of ecological stresses and economic pressures on the land makes this particular period a crucial one for preservation of riparian lands. Cities and towns need to develop strategies for protecting selected open spaces despite the economic escalation; at the same time serious analysis of the carrying capacity of local lands for development should be made.

This workbook contains information about a variety of land use controls and suggestions on how citizens can help get these approaches to open space protection implemented. In addition, there are a variety of state and private programs to assist with the purchase of open space which are described. Working jointly, despite all the pressures, it is still possible to protect land which is crucial to the character and environmental health of your community. There are many ways to protect riparian lands so that a buffer is created between the river and other uses. These methods include acquisition of land through purchases, working with landowners for conservation restrictions and regulatory measures.

A comprehensive way to protect rivers is to establish vegetated buffer strips on land contiguous to rivers. For the past twenty years, scientific studies have shown that vegetative buffer strips can play a substantive role in protecting river water quality. In buffer zones, trees, leaf litter and shrubs trap sediment, bond toxics and take up nutrients through vegetative uptake and soil adsorption. Native trees and plants which do not require pesticides or fertilizers protect the river, while grass lawns do not. Naturally vegetated buffers are one of the cheapest and most effective methods to protect water bodies from non-point pollution.

In addition, to protecting rivers from non-point pollution, *vegetated buffer zones*

- *provide habitat protection* by providing important corridors for wildlife
  - density and diversity of species are higher in river corridors where there is an underdeveloped land-water interface
  - corridors give plants and animals contiguous land for purposes of migration, feeding, breeding and shelter

- *provide cover* which reduces water temperature, shelters fish and provides food in the form of insect and plant droppings for aquatic life

- *provide protection from erosion*

- *help prevent flood damage*

- *protect vistas* for scenic enjoyment from bridges, canoes and from adjacent lands

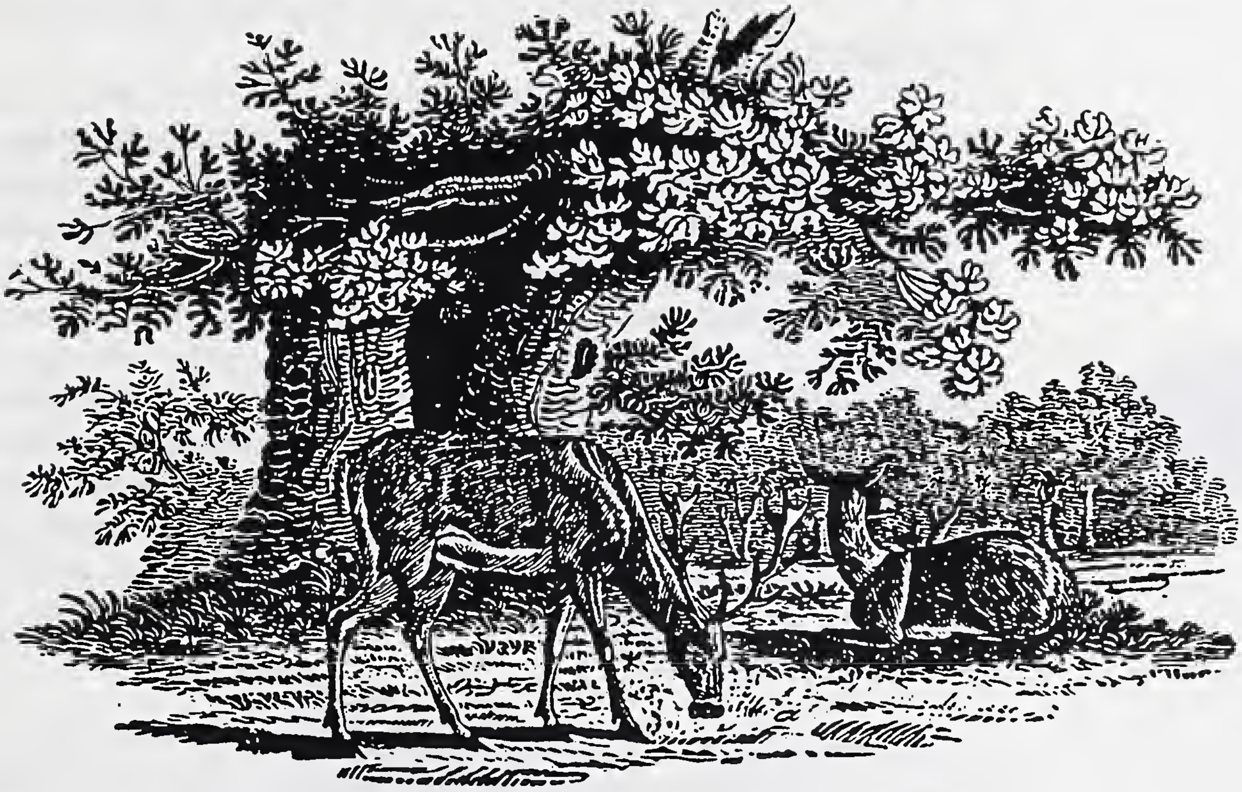
- *protect historical and cultural features* which maintain a community's character

- *enhance adjacent property values:* studies have shown that property abutting protected open land has increased property values

Studies have shown that different widths of vegetated buffer zones are needed for various values. For example, studies have suggested that 60–150 foot widths may protect streams from certain types of non-point source pollution, and that widths of 300–1000 feet are needed for wildlife protection.

Several communities in Massachusetts, realizing the important connection between land use and river protection, have created riparian buffer zones. Recent buffer zone widths have ranged from 50 feet in an urban area to 300 feet in two more rural towns. For ease of administration and because most communities cannot afford extensive research into local conditions, most buffer zones are of a standard width. For the past two years, a bill known as the Massachusetts River Protection Act has been filed in the state legislature which would create a uniform statewide riparian buffer of 150 feet.

PART II



Action Plan

Getting Organized

- Step 1: Set Goals—Envision the Results of Your Work
- Step 2: Identify Resources You Have to Work With
- Step 3: Organize Your Group

Gathering Information

- Step 4: Collect Land Protection Data
- Step 5: Collect Water Quality Data
- Step 6: Collect Water Quantity Data

Taking Action

- Step 7: Analyze Your Data and Build Action Plans
- Step 8: Keep Your Group Strong

SUMMARY

EIGHT STEPS. If you can envision the benefits that green riverway corridors will bring to your community, you are ready to take action to achieve your vision. This section of the **Adopt-A-Stream Workbook** outlines in detail an approach to organizing your efforts to adopt a stream and its surrounding lands. Some of you will be starting with the advantage of an organized group, perhaps already well-informed about the status of your stream and the issues related to protecting it (such as pollution sources, growth pressures, or environmental factors). Some of you are starting alone or with just one or two interested people. This workbook is organized from start to finish as if you are in the early stages of getting organized. But feel free to flip through and pick and choose those sections that fit your particular situation.

If, for example, you have a well-organized group and you have already established goals, you may want to skip the sections on setting goals and setting up a working organization. On the other hand, you may discover that it won't hurt to refresh your goals or to examine your organization to find out how to divide up tasks more effectively or how to avoid too few people doing too much of the work.

There are **eight key steps** to adopting a stream:

1. Envision the results; **2.** Identify your resources; 3. Organize your group; 4. Gather land information; **5.** Gather water quality data; **6.** Gather water quantity data; **7.** Analyze data and build an action plan; and **8.** Keep your group strong.

These steps can be clustered into three stages: *Getting information; Getting organized; and Taking action.*

This process includes getting interested people involved in a strong, well-run work group; assessing the resources available to you through this work group and their contacts; and setting goals based on the vision you have of your river or stream resource.

GETTING INFORMATION

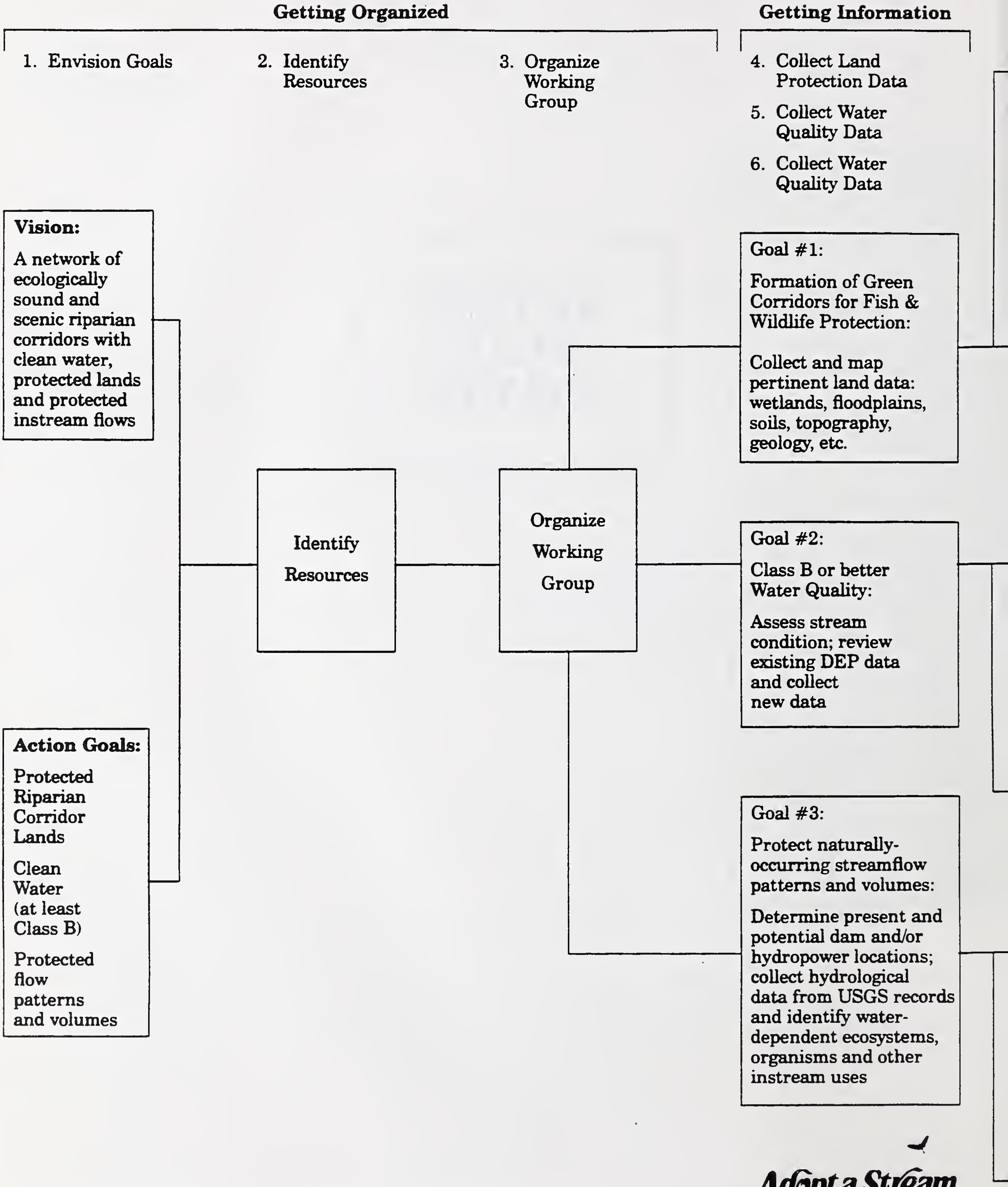
In order to plan effective actions for your group to take, you will need all sorts of information about your river and its surrounding area. It is helpful to break the data collection down by goal. For example, if your group has identified "Clean Water" and "Protecting Land" as its two key goals, it is easier to collect water quality data in one effort and land use and protection information in another effort.

Effective action will require careful analysis of the information you collect; formulation of activities which your group believes will help reach your goals; and planning to use your group's members to carry out the actions you decide on. An important part of this action component is keeping your group strong which requires constant attention.

The following pull-out chart describes the flow of these tasks. The remainder of the workbook offers suggestions for carrying out these eight steps through the stages of getting organized, collecting information and taking action.

ACTION PLAN CHART

FLOW CHART



Getting Organized

1. Envision Goals
2. Identify Resources
3. Organize Working Group

Getting Information

4. Collect Land Protection Data
5. Collect Water Quality Data
6. Collect Water Quality Data

Vision:

A network of ecologically sound and scenic riparian corridors with clean water, protected lands and protected instream flows

Action Goals:

Protected Riparian Corridor Lands

Clean Water (at least Class B)

Protected flow patterns and volumes

Identify Resources

Organize Working Group

Goal #1:

Formation of Green Corridors for Fish & Wildlife Protection:

Collect and map pertinent land data: wetlands, floodplains, soils, topography, geology, etc.

Goal #2:

Class B or better Water Quality:

Assess stream condition; review existing DEP data and collect new data

Goal #3:

Protect naturally-occurring streamflow patterns and volumes:

Determine present and potential dam and/or hydropower locations; collect hydrological data from USGS records and identify water-dependent ecosystems, organisms and other instream uses

TAKING ACTION

6. Analyze Data—Develop Action Plan **7. Keep Your Organization Strong**

1A. Riparian Land Protection through Purchase, Gifts, Easements via Landowner Involvement

1. Map river corridor lands; identify and approach landowners to explain land protection options.
2. Encourage and negotiate protection through fee simple, conservation restriction or other means to appropriate entity (land trust, conservation commission, DFWELE, etc.).
3. Locate and/or lobby for public and/or private funding for river coordinator and land protection and stewardship.
4. Encourage voluntary habitat improvement.

1B. Riparian Land Protection Through Local Bylaws, Regulations and Zoning

1. Analyze and check adequacy of local government environmental protection efforts (zoning, bylaws, regulations, etc.); rate town on the Riverways Community Report Card.
2. Review local environmental protection throughout the watershed and compare for inconsistencies and cumulative impacts.
3. Fill out matrix of applicable environmental protection tools for whole river basin.
4. Propose appropriate changes, additions to town bylaws; advocate for implementation.
5. Monitor enforcement of local bylaws and regulations.

2A. Point Source Pollution Identification, Abatement and Prevention

1. Review municipal, industrial, stormwater discharges and develop point source pollution profile of stream.
2. Develop point source pollution abatement/prevention plan.
3. Approach and monitor major identifiable sources.
4. Obtain timetable for construction/upgrading of treatment or abatement facilities, public and private.
5. Advocate for swift implementation of such facilities.
6. Monitor proper treatment plant operation and maintenance and compliance with NPDES permits.
7. Develop public information on point source pollution and prevention.
8. Advocate timely review, planning and construction of additional facilities or alternatives as needed (not after needed).
9. Increase relevant local protection through land use or controls (see below).

2B. Nonpoint Source Pollution Identification, Abatement and Prevention

1. Develop nonpoint source pollution profile of stream using a Shoreline Survey.
2. Organize a monitoring program for key suspected sources (roads, farms, construction, septic systems, etc.)
3. Develop public information on reducing nonpoint source pollution.
4. Develop or obtain model standards ("best management practices") for voluntary compliance program for businesses, homeowners, industries.
5. Organize clean-up events to publicize need and remove some sources of pollution (trash, etc.)
6. Collaborate with town officials on bylaw changes and improvements (see 1B above).

3A. Protect Rivers' Free-flowing Nature

1. Identify current and proposed dams, hydropower facilities, channelizations and similar projects.
2. Evaluate current and/or potential environmental impact of these facilities.
3. Advocate modifications and/or alternatives (e.g., fish ladders, natural valley storage) to proposed facilities deemed to have a significant negative environmental impact.
4. Advocate remedial action for degrading activities/facilities already in operation.

3B. Protect Adequate Instream Flows

1. Identify current and proposed withdrawals, diversions and sensitive areas/resources needing protection; compile an inventory of instream uses and functions.
2. Evaluate current and/or potential environmental impact of facilities affecting water levels.
3. Advocate modifications and/or alternatives (e.g., flow protection safeguards, water conservation) to proposed facilities deemed to have a significant negative environmental impact.
4. Advocate remedial action for degrading activities/facilities already in operation.

NOTES

STEP 1: ENLIST HELP—FIND PARTNERS IN YOUR RIVER PROTECTION CAMPAIGN

To get a river group started identify and recruit your natural constituency: groups or individuals who have similar values, goals and priorities for the river such as environmental groups, conservation commissions, garden clubs, anglers, canoeists, sportsmen, riparian land owners, students and teachers, naturalist, etc. Get in touch with local politicians, the media and the business community, it helps to have them on your side. Get these people committed to your river and then make your case to others. Let the rest of the community know why the river is special, why it should matter to the community. Identify and dramatize any threat(s) facing the river and what the benefits of protecting and improving the river would be. In order to succeed in your river protection efforts you will need as many people behind the river as possible, and the more committed they are, the more successful the river campaign will be.

Form a partnership with state organizations. In addition to guidance and assistance from the Massachusetts Riverways Programs, you can get information and help from the Massachusetts Watershed Coalition, the Environmental Lobby of Massachusetts, Massachusetts Audubon Society, the Conservation Law Foundation, the Appalachian Mountain Club, MASS PIRG or Trout Unlimited. You need help from state resource agencies and organizations who will support you through lobbying, research, fund-raising, publicity, etc. (Remember though, that the solution must be developed at the grass-roots level).

STEP 2: SET GOALS—ENVISION THE RESULTS OF YOUR WORK

Once you have group of people committed to working together, set goals for yourselves. To be effective, you need to have a clear vision of what you are working for. Once you start, it is easy to get sidetracked, caught up in details and hard work, or discouraged by roadblocks. If you have a clear image of how your river or stream can look, how it will benefit the community if it is cleaner and protected, and how it can be used by yourself and your neighbors, you will find it easier to deal with the shifts and changes that always come when you are organizing a community to solve a problem. When you become unsure of how to proceed, you can refer back to your group's vision and you will be surprised at how much that common image will help you determine just what your priorities or next steps at any given moment should be.

Try the following exercise to clarify your goals (which are statements of your vision).

Exercise 1

Have your group sit in a circle. With one person as "moderator" (and keeping time if necessary) ask each member of the circle to describe briefly how he or she remembers the river, envisions the river in five years, and then ten years. Or, you can project ahead as far as when the town's children are grown up. Focus on the positive possibilities, what people would like, rather than dire predictions about how it will "really be." Let your imaginations go . . . can you imagine a swimming spot? Can you see natural wildflowers along the banks? Can you envision scarce wildlife, birds and fishes replenished and thriving? Have one person jot down the comments, using a newsprint pad and magic marker.

After this exercise is done, ask the group to continue some general discussion and see if any strong consensus emerges (that is, ideas that everyone agrees are great, that everyone can buy into). At the end of the meeting, ask someone to type up the notes and be sure that every member of your group gets a copy for future reference. Use these notes to orient new members of your group over time, and to help yourselves refocus whenever the reasons for your work get blurry.

If you have any artists in the group, see if you can get a sketch of some of the ideas. Keep these sketches handy to remind everyone of your long-term goals.

Exercise 2

Take another few minutes in your circle and ask each person to name some of the impediments or problems which they see as preventing their vision of the river from being realized. Have a note taker list all the problems on the newsprint pad. For the first round of contributions take all suggestions without discussion or comment to allow for the greatest flow of thoughts and ideas. After all first suggestions are up on the paper, spend a few more minutes seeing whether various items are related and can be categorized together. At this point the list should be consolidated.

Then take a few more minutes together to see if you can find general agreement on the most severe problems, or a natural order for working on the issues you have identified. Sometimes it will be quite clear at this point that some problems have to be addressed before others. You may see that there are logical parallel sets of issues to work on. (Remember that some goals can be pursued simultaneously.) At the end of this discussion you should have a clear idea of your *priorities.* This review will help you organize yourselves into working groups or committees as needed.

STEP 3: IDENTIFY THE RESOURCES YOU HAVE TO WORK WITH

Before you lay out the specific steps your group is going to take, it is helpful to know what resources you have to work with. You need to inventory several types of resources:

1. The water resources related to your stream (surface waters, fisheries, etc.)

2. The people resources in your group (skills, contacts, networks, etc.)

3. The equipment your group can provide (i.e. computers, canoes, machinery etc.) and the funding resources available in the community (i.e. Lions Club, churches, local businesses etc.)

Use the accompanying worksheets to do these inventories. It is often very helpful to do this with the full group, since each person can contribute information and contacts which others may not have.

Worksheet #2

WATER RESOURCES INVENTORY

Check the following water resources in your community.

☐ River(s)

☐ Feeder ponds or lakes

☐ Related wetlands and floodplains

☐ Coastal Resources
  - ☐ Estuary
  - ☐ Salt Pond
  - ☐ Fish Runs
  - ☐ Fish or wildlife habitat
  - ☐ Cold water fishery
  - ☐ Warm water fishery
  - ☐ Waterfowl habitat
  - ☐ Shellfish fishery
  - ☐ Endangered species habitat (Describe)

☐ Does the river supply water for public use?

☐ Is there a current or potential hydropower site?

☐ Are there other impoundments?.

☐ Recreational resources
  - ☐ Swimming areas
  - ☐ Boat launches
  - ☐ Trails or other riverside uses
  - ☐ Scenic or historical sites
  - ☐ Marinas

PEOPLE RESOURCES INVENTORY

Please note any conditions which apply to your offering these skills to the group (such as hours of day, days of week, frequency, etc.).

SKILLS YOU CAN OFFER	NAME	ADDRESS	ZIP	TELEPHONE	CONDITIONS
Typing					
Bookkeeping					
Telephone Work					
Mailings					
Graphics					
Press of publicity					
Fundraising					
Speaking to local groups					
Research					
Writing					
Legal Skills					
Organizing Events					
Negotiating Skills					
Wildlife/fisheries skills					
Related Skills (specify)					
Computer Skills					
Real Estate Skills					
Scientific Skills					
Educational Skills					

EQUIPMENT and FUNDING RESOURCES INVENTORY

List here all resources your group can provide: equipment, such as computer, typewriters, truck; typing service; canoes or small boats; meeting space; water quality testing equipment; laboratory analysis services; and all possible sources of funding. This resource inventory can be added to after each project, as new people join and as new resources become available.

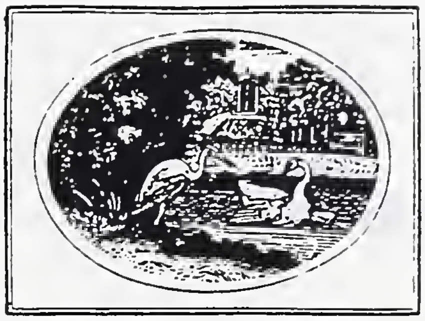
RESOURCE	NAME	PHONE	LOCATION	TERMS OF AVAILABILITY
Examples: Personal computer and printer	Jane Smith	333-3333	3 Old Smith Rd. Smithtown	Evenings 8 to 10; User must be oriented before use; Please schedule a couple of days ahead.

STEP 4: ORGANIZING YOUR GROUP

Once you have shared a vision with people who want to work on your river or stream, and you have taken inventory of the skills and resources you have to work with, it is time to get organized.

Here are some pointers to consider as your group gets started (or to compare to the way your group is already operating).

1. **Limit your specific goals and work plans to what can realistically be accomplished.** If you take on too much at once your group will inevitably become frustrated or discouraged. You can always add to your work plan as your group's size, experience and capability grow. Keeping your task manageable and measurable will help group morale, staying power and effectiveness.



2. **Rotate tasks whenever you can in order to share and build skills among all group members.** This includes chairing meetings, setting agendas, and all the myriad chores that go with keeping a group running well (mailings, phone calls, meeting notices, note taking, and so forth). You may find some unexpected or hidden talents in your group; in any case you will be less likely to find yourselves stuck because the one person who always does a particular task is unavailable.

3. **In a few specific cases, where certain tasks require continuity and accountability, assign the work to one or at most two people.** This especially applies to financial tasks and in some cases to record keeping and similar tasks. With some experience, you will learn which tasks do not adapt to the rotation method.

4. **Whenever possible work in pairs or small groups.** Using a partner system will prevent burnout, encourage people to learn from one another, spread work more fairly and generally keep up morale. This is especially important for assignments which people agree to do between meetings.

5. **Draw on the internal resources of the group.** Watch carefully to see who in your group has particular skills. You may discover that someone has a knack for meeting management or agenda setting. Ask that person to share ideas on those skills. Use your resource inventory to assign people to tasks and to partners. If one person can take the lead in a task but does not have all the skills, ask a second person with those skills to be the "partner" who can be called on as needed but not have to take a major role.

6. **Respect people's limits.** Most people work full-time or have a variety of family and community responsibilities. Be aware that if you set meeting times at the supper hour, or consistently on weekends, you are forcing people to choose between responsibilities and concerns. At every chance, try to build in some enjoyable events to which people can invite family and friends. This will help your members integrate their river work more fully into their lives and make it more likely that they can continue putting energy into your group.

7. **Make clear assignments.** Make tasks manageable, with clear timelines. Everyone should get a task at each meeting, no matter how small, so that you set the precedent for spreading work evenly. People will naturally have cycles when their time is more or less available, but they can almost always make a phone call or some other small task. Keep a clear list of assignments so that progress can be charted from meeting to meeting.

8. **Set up committees.** Groups can utilize two basic types of committees (which are nothing more than small working teams-two people can constitute a committee). Some ongoing tasks require **standing committees.** Membership and outreach, finances and fundraising, and long-term tasks such as monitoring water quality or working on land protection are good candidates for standing committees. **Special committees** are good for short-term or periodic work. It is important to set clearly defined tasks for these committees to accomplish. A spring clean up campaign or public education program for River Month would be good purposes for special committees.

9. **Keep your organization open to new people and ideas.** Check every so often to be sure that your group does not suffer from "founder's disease," a common malady of groups which keeps a group closed and unavailable to new members because only the old members know what is going on and tend to take on all the tasks. Actively work on ways to involve new people, make them feel welcome and included in the group.

10. **Reassess your organization periodically.** Take the time once or twice a year to review your goals, your membership, your workload and the progress you've made on specific tasks. Are there specific roadblocks you can identify? A key person who is too overworked? Too many simultaneous projects? Too few new members? Lack of understanding of river issues in your local communities? See if you can identify ways to remedy these difficulties. It may just take a pause and some group attention to make a major difference in your effectiveness.

11. **Review your formal options for organization (incorporation, non-profit, tax exempt, etc.).** There are a variety of ways that groups can become formal organizations in the eyes of state and federal governments. It is important to understand these options and choose the one which suits your group and its purpose best. It is equally important not to get stuck trying to figure out all the tiny details of the incorporation process. Any good lawyer (perhaps there is one in your group) can draw up a set of bylaws and explain how to **file** with the Commonwealth and the federal government. You must also learn the required set of reports and minor annual fees which are required. Tax exempt status is valuable because you do not have to pay taxes on payments to employees. Federal tax-deductible status (section 501 (c)(3)) is valuable because donations to your organization allow tax advantages for the donor. It takes some time to obtain the official IRS status as tax-deductible, so it is wise to allow sufficient lead time from when you need to be raising funds which require your group to have such a status. There are many groups you may turn to for samples of bylaws and guidance on corporate structure. Take advantage of these, and do not spend the time reinventing language and structure which you can easily borrow.

GATHERING INFORMATION

To develop and carry out your work plan, you will need lots of information. Much of it is available through state agencies or existing advocacy groups; some of it you may have to collect, such as specific land ownership information. You need information to carefully analyze your rivers situation and to select the action steps which will make a difference.

One approach to collecting information, a method to make the data collection process somewhat manageable, is to organize your data collection by goal. For instance, if your two major goals are "improving water quality" and "protecting riparian lands" you can break your information collecting into two main branches. An outline for collecting information related to these two goals would look like this:

GOAL	INFORMATION TO COLLECT
Land Protection	1. Maps of physical and ecological characteristics such as: Topography, Soils Bedrock geology Groundwater hydrology Vegetation Endangered species and habitat Wetlands Flood plains 2. Maps of land ownership 3. Maps of land uses and zoning (potential use) 4. Check list of local land-use/ environmental protection bylaws.

GOAL	INFORMATION TO COLLECT
Water Quality Improvement	1 Shoreline Survey 2. Biological/habitat observations 3. Chemical analysis 4. Point source pollution profile 5. Non-point sourcepollution profile 6. Other water quality data

GOAL	INFORMATION TO COLLECT
Water Quantity Improvement	1. Flow a) Citizen monitoring b) USGS gaging stations 2. Water level and habitat relationships (wetlands, stream bottom, riffles, pools) 3. Water Supply Withdrawal—location and volumes—DEP 4. River Basin Plans—DEM 5. Community Water Conservation Plans

Before you begin the process of collecting data yourselves, your group should make a thorough survey of information which is already available. Information Sheet #5 describes sources of data on land and water. Using these materials can save tremendous amounts of time; even if the reports are somewhat out of date, it may take less time to update than to start from the beginning.

SOURCES OF DATA ON LAND AND WATER
Where to Get Information for Stream Protection

LAND INFORMATION

Sources you can use	*Where available*
U.S. Quadrangle Topographic Maps show topography, lakes, rivers, streams, wetlands, buildings, roads, gravel pits and gaging stations at time of printing.	U.S. Geological Survey (USGS) Map Distribution Federal Center Bldg. 41 Box 25286 Denver, CO 80229 *or* local map or sports stores
U.S. Geologic Quadrangle Maps show location of sand, gravel, various deposits and sediments. Commentary included on landforms, soil profiles and significant patterns and changes in the area.	
MassGIS Maps of Protected Lands & Recreational Open Space MassGIS is currently working to update a statewide map of protected open space. The maps currently show state and federal open space land holdings, and Mass GIS is gathering information on community and private land holdings which are protected.	MassGIS EOEA Data Center 20 Somerset Street Boston, MA 02108 (617) 727-3888
Water Supply Atlas & Maps Four overlay maps used with USGS topographic maps show (1) surface drainage basins, (2) permitted discharges, (3) location of public drinking water supplies, and (4) potential sources of contamination (land fills, salt storage, junk yards)	Department of Environmental Protection Division of Water Supply One Winter Street, 9th Fl Boston, MA 02108 (617) 292-5913
Wetland Conservancy Maps Wetlands Conservancy Maps show wetlands as well as all geographic details and man-made structures, roads and land form changes. Maps currently have been produced for twenty percent of the state.	Cartographic Information Resource Services Hasbrouck Lab, Room 102D University of Massachusetts Amherst, MA 01003 (413) 545-0359 or Contact DEP at (617) 292-5907

All of the following are available at town or city hall offices of selectmen, Town Manager, Planning Board, Assessors, Conservation Commission.

Sources you can use	*Where available*
Floodplain Maps Maps show 100 year and 500 year flood boundaries in a town or city for flood insurance purposes published by Federal Emergency Management Agency (FEMA) for the cities and towns.	Flood Hazard Management Program Division of Water Resources Department of Environmental Management 100 Cambridge Street Boston, MA 02202 (617) 727-3267, or call 1-(800)-638-6620
Soil Survey Maps Maps show soil types and indicates limits of use.	Soil Conservation Service (SCS) U.S. Department of Agriculture (USDA) 451 West Street Amherst, MA 01002 (413) 253-4350 or County Field Offices
Zoning/Land Use Maps Maps show town areas designated for specific uses (whether or not implemented.)	Town or City Hall Town or City Planning Board Regional Planning Agency
Assessor's Maps Maps show house lots and land ownership.	Town or City Assessor's Office
Open Space and Recreation Plans show open lands and recreational resources and provide basis for present and future use and management of resources.	Town or City Planning Board Conservation Commission Division of Conservation Services EOEA 727-9800, x292
Riverway and Greenway Plans usually have recommendations for river protection. Plans include maps of lands along rivers and location of special resources and pollution problems. Many river basins do not have completed plans.	Town or City Planning Board Conservation Commission Regional Planning Agency Watershed Association Riverways Program 727-1614, x358
Massachusetts Greenways Council (MGC) and the Metropolitan District Commission (MDC) both work to protect and preserve corridors of land and to establish greenways in Massachusetts.	MGC, c/o Corridor Planner DEM, Bureau of Resource Conservation 727-3160, x574 MDC Planning Office, Office of the Commissioner, (617) 727-9693 Charles River—Dan Driscoll Neponset River—David Queely Charles Basin & Mystic River—John Krajovic Watershed Division—Pat Austin (617) 727-2043

WATER INFORMATION

The Department of Environmental Management publishes a directory of State, Federal, and Regional Water Planning and Management Agencies. For a copy, contact:

DEM-Division of Water Resources
100 Cambridge Street, Room 1304
Boston, MA 02202
(617) 727-3267

For WATER POLLUTION Information, general data and background on dischargers, enforcement:

STATE

Department of Environmental Protection (617) 292-6983
Division of Water Pollution Control
1 Winter Street, 9th Floor
Boston, MA 02108

Water Quality Research Section, (508) 727-6983
River Basin Planning Program
P.O. Box 116
North Grafton, MA 01536

Division of Environmental Monitoring (617) 682-5237
Lawrence Experiment Station
37 Shattuck Street
Lawrence, MA 01843

DEP Regional Offices
(see list at end of this section)

Department of Environmental Management (617) 740-1600
Division of Waterways
349 Lincoln Street, Building 45
Hingham, MA 02043

FEDERAL

US Army Corps of Engineers Public Affairs (617) 647-8778
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

US Environmental Protection Agency (EPA)
Region 1
JFK Federal Building—Government Center (617) 565-3420
1 Congress Street
Boston, MA 02203

Water Management Division	565-3480
Nonpoint Source Pollution	565-3513
Wetlands Protection	565-4429
NPDES	565-3560, 565-3525
Program Operations Section	565-3525
Compliance/Enforcement	565-2489
Water Quality	565-4420

For WATER SUPPLY Information: general information, reservoirs, aquifers, wells, drinking water, treatment and regulation:

STATE

DEP
Division of Water Supply (617) 292-5770
1 Winter Street, 9th Floor
Boston, MA 02108

DEP Regional Offices
(see list at the end of this section)

Department of Environmental Management (DEM)
Division of Water Resources (617) 727-3267, x588
100 Cambridge Street, 13th floor
Boston, MA 02202

Massachusetts Water Resources Authority (MWRA)
Charleston Navy Yard
100 First Avenue
Boston, MA 02129
Public Affairs 242-6000
Water Supply Citizens Advisory Committee (413) 586-8861

Metropolitan District Commission (MWRA)
20 Somerset Street
Boston, MA 02108
Watershed Management (617) 727-5274

FEDERAL

US EPA
Water Management Division
Water Supply Branch 565-3610
State Water Supply Programs 565-3669
Technical Assistance Section 565-3669
Office of Groundwater Protection 565-3597

US Geological Survey (USGS)
Water Resources Division (508) 485-6360
28 Cord Road, Suite 280
Marlboro, MA 01752

For WETLANDS Information:

STATE	**DEP**	
	Division of Wetland Protection	(617) 292-5695
	1 Winter Street, 9th Floor	
	Boston, MA 02108	
	DEP Regional Offices	
	(see list at end of section)	
FEDERAL	US Army Corps of Engineers	
	Public Affairs	647-8778
	Operations Division	647-8320
	US EPA	
	Wetlands Protection	(617) 565-3474

For FLOODPLAINS Information:

STATE	**DEM**	
	Division of Water Resources	(617) 727-3267
	Flood Control Program	
	Floodplain Mgmt. & Assistance Program	
	Office of Planning and Development	(617) 727-3160
	Dam Safety Program	
FEDERAL	**US Army Corps of Engineers**	
	Planning Division	
	Flood Control	(617) 647-8532
	Basin Planning	(617) 647-8555
	Operations Division	
	Flood Control/Recreation	(617) 647-8320
	Federal Emergency Management Agency (FEMA)	(617) 223-9522
	Region 1	
	JW McCormack Post Office Bldg., Room 442	
	Boston, MA 02109	
	Natural & Technological Hazards Division	
	(National Flood Insurance)	(617) 223-9561

For TECHNICAL ASSISTANCE or for answers to questions: specific projects affecting wetlands or water quality, contact the DEP regional offices.

For questions about DEP policies or regulations, contact the Boston office.

REGIONAL DEP

Metropolitan Boston/ (617) 935-2160
Northeast Regional Office or
5 Commonwealth Avenue (617) 727-5194
Woburn, MA 01801

Southeast Office (508) 947-1231
Lakeville Hospital
Middleboro, MA 02346

Central Office (508) 792-7650
75B Grove Street
Worcester, MA 01605

Western Office (413) 784-1100
State House West
436 Dwight Street, 4th Floor
Springfield, MA 01 1 03

For FISHERIES, WILDLIFE, HABITAT information:

DIVISION OF FISHERIES & WILDLIFE

Boston	(617) 727-3151
Westborough	(508) 797-7270
Regional Offices	
Northeast	(508) 262-4347
Southeast	(508) 759-3406
Central	(508) 835-3607
Conn. Valley	(508) 323-7632
Western	(413) 447-9789
Waterfowl	
H. Heusmann	(508) 792-7270
Nongame birds	
Brad Blodget	(508) 792-7270
Nongame mammals	
Tom French	(617) 727-3151
Jim Cardoza	(508) 792-7270
General Fisheries	
Mark Tisa	(508) 792-7270
Natural Heritage Program	
Henry Woolsey	(617) 727-9194
Environmental Impact Assessments	
Dick Keller	(508) 792-7270
Education Programs	
Ellie Horwitz	(508) 792-7270
Forestry Planning for Wildlife	
Jim Scanlon	(508) 792-7270
Land Acquisition	
Bill Minior	(617) 727-3151

DIVISION OF ENVIRONMENTAL LAW ENFORCEMENT

Complaints/Officer Needed	1-800-632-8075
Legal Questions	(617) 727-6398
Hunter Safety	(508) 792-7243
Boating Safety	(617) 727-6398
Hazardous Waste	(617) 727-2200

DIVISION OF MARINE FISHERIES	(617) 727-3193
Public Access Board	(617) 727-1843
RIVERWAYS PROGRAMS	(617) 727-1614 x360

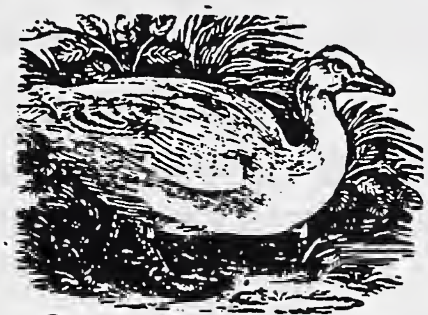
STEP 5: COLLECT MORE LAND PROTECTION DATA

To find out what trends are occurring in the area around your river, what characteristics mark the land, what factors are shaping the physical and economic shape of the region, you will need to collect and review quantities of information. Much of the information can be found in existing maps and reports, with site visits to verify actual land uses or changes by direct observation. The particular analysis your group makes of all this information will direct your on-going work. What land is still available for protection? What approaches will help secure these sites? What range of actions—from purchase to town bylaw changes, can be instituted to protect river lands?

A good way to document existing conditions is to conduct an initial shoreline survey. This survey of the shoreline can be used to identify areas where water quality is threatened by point or non-point source pollution associated with land uses, identify locations where improved access is needed, or where excessive recreational use is causing too much wear and tear on the stream line or shoreline. It may also help identify lands that could be protected through conservation restrictions or open space acquisition.

Regular observations of one area on a daily, weekly, monthly, seasonal or yearly basis can help spot changes in conditions early and alert the watershed association to places of special concern. Observations over a longer period of years can help identify trends in water quality and changes in land use.

The following information sheets and worksheets offer suggestions for collecting and using this land data.



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MAPPING LAND INFORMATION

An easy way to store the information you collect about the land adjacent to your river or stream is to put it on a map. This visual method of recording data will help you perceive trends, situations and factors in your river area which may not be readily apparent through written facts and figures.

Here are some pointers for mapping the land information you collect. For more details obtain the Rand Mapping Package, listed in the *Resources* section at the back of this manual.

1. Start with a **Base Map,** that is, a map which presents the basic area you are interested in, with certain basic information depicted: roads, buildings, rivers and streams, ponds and other water bodies, railroads, and other surface features of the land. The best base maps are clearly drawn, consistent and have simple depictions of features. Often the U.S. Geological Service (USGS) maps are used as base maps. They come in "quadrangles" or "quads" which cover specified areas. Quads match up edge to edge; you may need more than one quad to cover your entire area of interest. USGS uses two scales—one inch to 25,000 feet or one inch to 15,000 feet. Be sure that all your quads are in the same scale to avoid confusion.

2. Determine the other features which you want your maps to describe. Consider: floodplains, wetlands, aquifer recharge areas, slope or terrain (hills), dams, town wells, dumps, wastewater treatment plants, salt storage sites, habitat for endangered species, recreational lands and open space (including boat ramps, private parks, wildlife preserves), zoning and current land uses (particularly business or industry which could be likely contributors to stream pollution), and property boundaries with landowners' names. Since all of this information on one map may become illegible, you should choose the information of most value to you to place on your base map. Other information can then be prepared as overlays or companion maps.

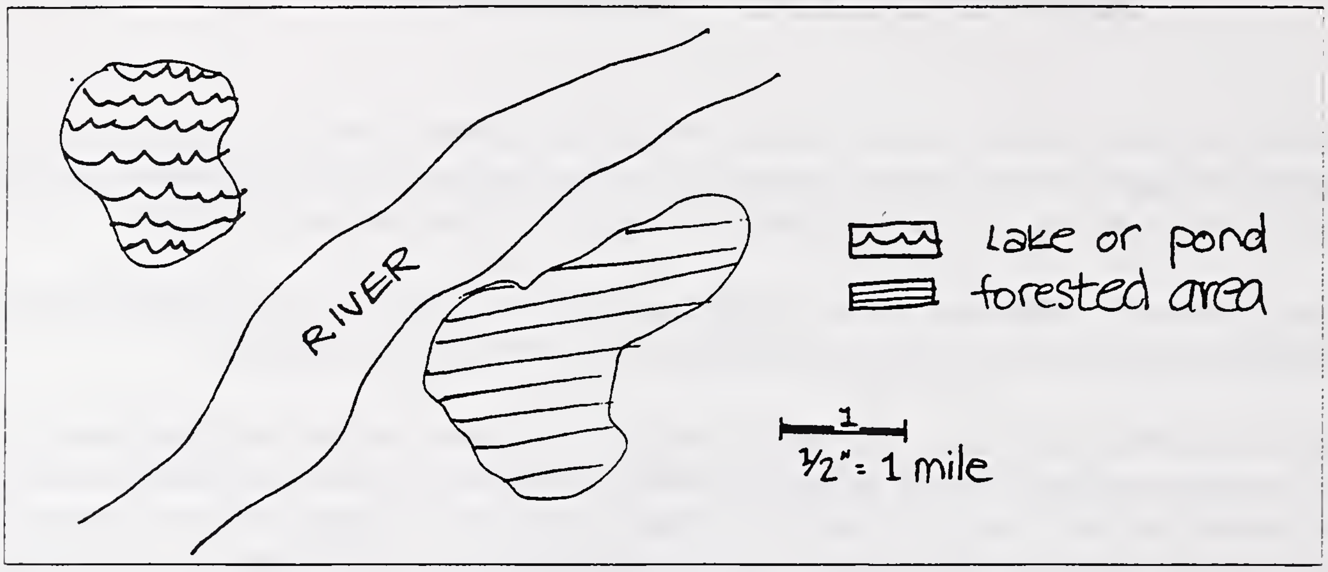
3. Select the types of **overlays** you want for your base map. You may choose to put all zoning and current land use information on one map; all water related data (such as aquifers and wetlands) on another. It is easiest to put overlays on transparent sheets of plastic (called mylar) or strong tracing paper. Another approach is to make several copies of your base map and transfer the data to companion maps.

4. Enlarging the part of your base map where your river is located can be very helpful. Maps can be enlarged by photocopy machines, giving you a more detailed rendition to display your data on. Make several copies for the different types of data that you want to map.

5. Remember that if you plan to make copies of working maps that colors will not show up. It is wise to use patterns and cross hatches, as well as colors, for maximum visibility in copies.

6. If you've never used a topographical or hydrological map, ask your town planners, district offices of state agencies or your regional planning agency for orientation. Often the source of the maps can give a quick explanation about how to read them.

7. Be sure to mark your "legend" (notes about what symbols, colors and patterns represent) right on the map to assist users. Make an easy to read graphic notation showing scale, i.e. 1/2 inch equals 1 mile.



8. To map land ownership information you may find an assessor's map to be a better base map. [If there is a town wide assessor's map that delineates property boundaries, enlarge the portion near the river by photocopy machine.] Number each parcel along rivers; then use the files and maps in the assessor's office to record information about the owner, parcel size, valuation, and other pertinent information on note cards. Label each separate parcel with a number, corresponding with the number on your note cards.

The Audubon Society has prepared some excellent information about mapping, particularly water resources. References are provided in the Resources appendix at the end of the **Workbook.**

Worksheet #7

RIVERWAYS COMMUNITY REPORT CARD

RATING YOUR COMMUNITY'S EFFORTS IN RIVER PROTECTION:

Riverways has designed this report card to help local officials and river advocates determine how much more work their communities need to do to protect their rivers. Towns have the responsibility and the authority for land use planning through bylaws, regulations and zoning. If towns do not do this planning, resources will be lost, and the town character may be changed. Regulation is a low/no cost method of protection. Towns are familiar with many zoning and regulatory techniques, but many towns have not as yet utilized them for rivers. River protection is in its infancy in Massachusetts. We need to work quickly to protect and restore our rivers for the future. A "plan" answer receives one point, and a "no" answer receives no points.

The questions are divided into two segments. The first looks at protecting the land adjacent to the river and the tools for protection. The second segment looks at protecting the river's water quantity and quality by various methods.

Generally, the questions have three choices: "yes", "plan", and "no". A "yes" answer receives two points. A "plan" answer indicates that your community has actually begun the planning for the bylaw or regulation, but has not yet approved the final version.

Few towns will receive "excellent" or even "good" scores. The purpose of the report card is to determine what needs to be done.

We recommend that watershed associations work with their member towns to complete the report card so that both the association and the towns will know the extent of the protection throughout their watershed. By sharing knowledge, cities and towns will support each others efforts and more will be done to protect the rivers. At the end of the data collection, a composite could be made. This composite should be shared with the local towns as a means for action and should be shared with the Regional Planning Agency for its information gathering. Riverways would appreciate a copy for its file.

SCORING:
A "yes" answer receives two points; a "plan" answer receives one point, and a "no" answer receives no points. (A "plan" answer means concrete plans are in the works; it does not mean good intentions.)

Protection for Riparian Lands

35+ points: incredible
25–35 points: excellent
15–25 points: good–very good
10–15 points: fair–good
5–10 points: needs work
0–5 points: your river needs help!

Protection for River Water: Quantity and Quality

12–15 points: excellent
9–12 points: very good
6–9 points: good
3–6 points: fair
0–3 points: your river needs help!

RIVERWAYS COMMUNITY REPORT CARD

COMMUNITY NAME: ____________________

NAME RIVERS AND STREAMS IN COMMUNITY: ____________________

____

REPORTERS' NAMES: ____________________

NAME OF PERSON(S) INTERVIEWED: ____________________

____

____

DATE: ____________________

HOW DOES YOUR COMMUNITY RATE IN PROTECTION OF LAND ADJACENT TO RIVERS?

A. Land: preservation in place: (2 points for every 10 percent of river miles which have been protected)

1. What percentage of the land adjacent to rivers in your town is in public ownership or protected by Conservation Restrictions, or protected by a building setback (buffer zone)?

   Total miles along the river: _____

   _____ Percentage that is protected by public ownership:

   _____ Percentage that is permanently protected by CRs:

   _____ Percentage that is protected by river buffer zone:

2. Enforcement: Are the protection devices (CRs and buffer zones) enforced? (same scoring as above). Add 2 points for each 10% river land in public ownership.

B. Land: regulatory protection: (2 points if completed; 1 point if in planning stages)

Yes Plan No **Does your community have?**

○ ○ ○ 3. floodplain zoning which prevents building in the floodplain? (1 point for minimum floodplain zoning)

○ ○ ○ 4. zoning which prohibits industrial uses, landfills, hazardous waste sites next to the river?

○ ○ ○ 5. a local Wetlands Bylaw which gives additional protection to river banks?

C. Land Preservation tools: (2 points if completed; 1 point if in planning stages)

Yes Plan No **Does your community have?**

○ ○ ○ 6. maps which include the rivers, principal tributaries, adjacent lands and related wetlands?

○ ○ ○ 7. a practice of working with state agencies or private land trusts to purchase open spaces, particularly wetlands and along rivers?

○ ○ ○ 8. an approved open space plan (necessary for self-help funds) which includes recommendations for river protection

○ ○ ○ 9. a program by the Board of Assessors to give property tax abatements to those who have conserved land by placing permanent Conservation Restrictions on the land?

○ ○ ○ 10. lands along the river under Chapter 61, 61A, and 61B? (State program to protect lands for forestry, agriculture and recreation). {1 point}.

Other Programs:

Yes Plan No **Does your community have?**

○ ○ ○ 11. any other programs designed to help the river? please list each program at the bottom of this page. (Give each answer 2 points.) For example, cluster zoning along the river to preserve greenway

○ ○ ○ 12. an advisory committee focused on river protection? it could be called a greenway committee or be a subcommittee of the Planning Board or Conservation Commission) which
- advises on river issues
- has an ongoing program to advise landowners on environmentally sensitive issues and/or on land conservation options and tax ramifications?

RIPARIAN LAND PROTECTION SCORING

SCORING:

A "yes" answer receives two points; a "plan" answer receives one point, and a "no" answer receives no points. (A "plan" answer means concrete plans are in the works; it does not mean good intentions.)

Protection for Riparian Lands

35+ points: incredible
25–35 points: excellent
15–25 points: good–very good
10–15 points: fair–good
5–10 points: needs work
0–5 points: your river needs help!

HOW DOES YOUR COMMUNITY RATE IN PROTECTING RIVER QUANTITY AND QUALITY?

WATER:

A. Regulations and Bylaws relating to water quality: Does your community have: (2 points each, unless otherwise indicated)

Yes Plan No **Non-point source pollution abatement:**

○ ○ ○ 1. aquifer (1 point) or watershed zone which includes the river and adjacent lands (2 points)?

○ ○ ○ 2. bylaws (or Board of Health regulations) governing underground storage tanks and/or hazardous materials?

○ ○ ○ 3. Board of Health regulations requiring septic system inspections (perhaps tied to sale of houses and businesses) or septic system pump-outs?

○ ○ ○ 4. Board of Health regulations increasing minimum protection given by Title V of the State Environmental Code?
- distance from wells and reservoirs
- distance from rivers
- distance from the water table

○ ○ ○ 5. a reduced road salt program near rivers?

Point source pollution abatement:

○ ○ ○ 6. for towns with wastewater treatment plants or other NPDES dischargers (2 points each):
- are operators sensitive to river protection concerns?
- is system in compliance? (has this been monitored?)
- has town paid for needed upgrading?

B. Conservation of water: (2 points each)

Yes Plan No **Does your community have?**

○ ○ ○ 7. an official water conservation program explaining the importance of reducing water use to
- reduce the need for additional water sources (**may affect river quantity)**
- reduce wastewater? (**may affect river quality)**

○ ○ ○ 8. a program which provides for: (2 points each)
- 100% metering for the system?
- enterprise accounting with proceeds directed toward aquifer/watershed land purchase
- leak repair so that there is less than 5% unaccounted for water?

Prepared by the Riverways Programs (with thanks to Gregor McGregor, Esq.)

SCORING:

A "yes" answer receives two points; a "plan" answer receives one point, and a "no" answer receives no points. (A "plan" answer means concrete plans are in the works; it does not mean good intentions.)

Protection for River Water: Quantity and Quality

12–15 points: excellent
9–12 points: very good
6–9 points: good
3–6 points: fair
0–3 points: your river needs help!

STEP 6: COLLECTING WATER QUALITY DATA

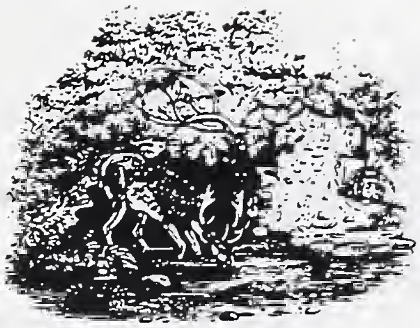
To determine the general health of the stream system, you will need to assess:

1. The overall level of water quality (pollution profile from existing information);

2. Types of pollution or land use degrading the water and banks;

3. Range of water-dependent flora and fauna supported.

Basic data on individual stream segments include: appearance—color and surface condition; odor; nature of the banks—grassy, steep, shaded, etc.; flow characteristics; types of plants and animals—fish, mammals and insects; and land use along the banks.



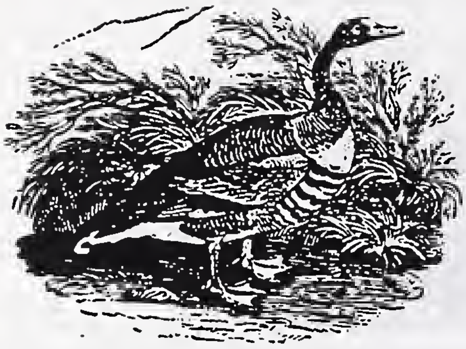
Unfortunately, water quality monitoring by the Department of Environmental Protection's Division of Water Pollution Control has been sharply curtailed by state budget cuts. The DWPC used to sample and prepare water quality management plans (known as basin plans) for all major river and streams in the state. They also sampled and analyzed sediment and fish flesh to determine whether pollutants had accumulated in river bottoms and contaminated aquatic life through the process of bioaccumulation. Now, however, the program has been scaled back; most of the testing done is to determine compliance with NPDES discharge permits. This makes it all the more important for watershed associations, Adopt-A-Stream groups and individual citizens to get involved in monitoring our rivers.

There are two types of pollution which can cause a river not to support its best use—**point** and **non-point sources.** Point sources can be most easily described as pipes from dischargers such as industries or sewage treatment plants. Point sources are regulated under the Clean Water Act and are often restricted in amount of flow and types and amounts of pollutants which may be discharged, and must be reported to the state and federal environmental agencies.

Non-point sources are indirect discharges—uncontrolled runoff from different land uses. Examples of non-point sources and types of pollutants include: parking lots and stormwater sewers, litter, oil and animal wastes; agricultural lands contributing chemical fertilizers, pesticides and soil erosion from plowed fields; construction, logging or mining sites contributing eroded soil; hazardous waste and garbage landfills, and failing septic systems contaminating groundwater which drain to nearby surface water streams. Because of the indirect and intermittent nature of non-point sources pollution, most are not regulated, or specifically sampled. In some streams and stream segments though, non-point sources are a significant factor in non-attainment of water quality to support best uses.

While much of the technical data that you need to plan, organize and mobilize people for river protection already exist, there are advantages to obtaining some of the information directly in the field. Sources of potential non-point pollution can be best identified in the field. By getting people out to see the river and by observing the conditions directly, your group will have a much more vivid picture of their purpose, as well as the problems and potential of your stream. A shoreline survey is a good "hands-on" approach for getting people interested.

The following set of worksheets and information sheets provides several approaches to surveying the health of your stream.



The **Stream Walk Survey Worksheet** (#8) is an inventory form for the easily observable physical aspects of the stream channel, banks and adjacent land uses. All these factors may be indicators of stream health. Using this information you can identify localized problems and propose local solutions.

The **Potentially Polluting Practices Worksheet** (#9) contains information on sources of non-point source pollution, their effects upon the environment, and what you can do to prevent non-point source pollution.

The **Unusual Colors & Odors Worksheet** (#10) provides background on what some of the colors, odors and land uses you've identified might tell about your stream and its need for protection.

The **How & Where To Report Evidence of Pollution Worksheet** (#11) tells you the first people to contact once you have evidence of pollution, and how to get in touch with them.

The **Pollution Profile/NPDES Worksheet** (#12) provides a format to organize some of the available information about sources of pollution, and lists sources of information related to monitoring dischargers.

The **Recognizing and Controlling Erosion Worksheet** (#13) provides information on the causes of erosion, its effects on stream life and ways to prevent erosion.

Once you have conducted a preliminary stream walk you may wish to conduct a more formal Shoreline Survey, listed under Adopt-A-Stream Team Monitoring Project in Part III, Resources, in the back of this workbook. Also available from the Riverways Program are the Chemical, Physical and Biological Monitoring packets which can help you get started on more technical monitoring programs.

STREAM WALK SURVEY

This survey form provides a checklist for a number of physical characteristics and other indicators of stream health. Remember that your stream may differ from stretch to stretch; use a separate copy of the checklist for each stream or segment carefully noting the beginning and end points of each segment you observe. Also, conditions may vary noticeably with the time of year, level of stream flow, and other seasonable variables. You may want to sample more than once; if so, be sure you keep copies of each survey to compare to subsequent observations that you make.

Your group may not contain professional scientists. Don't worry about making rough estimates or "unscientific" observations. General and informal data will still be very valuable for your purposes.

Stream ______________________ Date ______________________

Temperature ______________________ Segment landmarks ______________________

Water Appearance:

- ☐ scum
- ☐ foam
- ☐ muddy
- ☐ clear
- ☐ milky
- ☐ colored sheen (oily)
- ☐ brownish
- ☐ other

Stream Bed Coating:

- ☐ orange to red coating
- ☐ yellowish coating
- ☐ black coating
- ☐ brown coating
- ☐ none

Odor:

- ☐ rotten egg odor
- ☐ musky odor
- ☐ none

Covering	*Good covering* (70%–100% of bank soil covered by plants, rocks and logs	*Fair covering* (30%–70% of bank covered by plants, rocks and logs)
Stream bank	☐	☐
Top of bank	☐	☐

Stability of stream bed:

Poor covering
(less than 30% of covered by plants, rocks and logs)

Did the bed sink beneath your feet in ☐ no spots, ☐ a few spots, ☐ many spots

Width of Study Area:
pool section ____________________ riffle section ____________________

Depth of Study Area:
pool section ____________________ riffle section ____________________

Speed of Stream's Flow ____

Land Use Profile

Type of development along shore

☐ urban
☐ suburban
☐ rural
☐ agricultural
☐ industrial
☐ commercial
☐ residential

Presence of

☐ discharge pipes (I)
☐ construction activity (I,C,R)
☐ pasture (A)
☐ cultivation (A)
☐ landfills (I)
☐ mines (I)
☐ quarry (I)
☐ logging operations (A)
☐ lawns (R)
☐ park/open space (R)
☐ parking lots (I,C)
☐ highways (I)

☐ I = Industrial or infrastructure
☐ C = Commercial
☐ R = Residential
☐ A = Agriculture

Make a simple diagram to note where you can identify land uses and types of pollution.

POTENTIALLY POLLUTING PRACTICES

How You Can Reduce Non-Point Sources of Pollution

Practice	**Environmental Effect**	**Alternative**
Pouring oil drained from cars into street or gutter.	When oil enters stream it can kill aquatic life.	Take the oil to a service station. Most station managers will allow customers to pour their used oil into the station's storage tank. (Mass. Law requires any place that sells oil to take used oil back.)
Dumping grass clippings material or leaves into a stream or gutter.	When the leaves or grass enter water they will decay and use up oxygen.	Either be composted or bagged and put out with trash. Leaves could be mulched running a mower over the lawn with the vent closed. Grass may be left on the lawn, or raked up after every third cutting.
Fertilizing the lawn.	Fertilizers, when washed into a body of water, can cause algae to grow too much.	Most lawns need only nitrogen. This gets rid of the need for the stronger phosphorus fertilizers that encourage algae. Directions on the fertilizer bags should always be followed.
Spraying pesticides about the home and garden.	Pesticides can kill fish and other life when washed into our waters.	Maintaining a healthy lawn with proper cutting and careful fertilizing is the best way to keep out weeds. Bugs that attack garden plants can usually be washed off with a hose or picked off by hand.
Allowing pet to run free.	The manure pets leave behind on the ground can spread disease or use up oxygen when washed into our waters.	Pets should be kept within a fence or on a leash.
Feeding geese	"Domesticates" geese; prolonged stay at lakes and rivers contributes wastes that increase nutrient levels and deplete oxygen.	Call DFW Dick Burrell HQ–KIP–LM e-mail.

UNUSUAL COLORS AND ODORS IN WATERS

Evidence of Point and Non-point Sources

Condition	**Possible Cause**
Muddy water	Erosion of soil in upstream area; in tidal waters it could also be caused by high winds.
Greenish Color	Microscopic plant cells called algae. Algae growth may exceed normal limits due to excessive amounts of nutrients entering the water. Nutrient sources include: fertilizers, pet waste, grass clippings, leaves, etc.
Yellow-brown to dark brown water	Acids released from decaying plants. Naturally occurs each fall when dead leaves collect in the stream. Also common in streams, draining marsh or swampland.
Orange to red coating on stream bed	Results from bacterial action upon iron. May indicate a high erosion rate or industrial pollution.
Colored sheen on water surface	May indicate oil has entered the stream, particularly if there is also an oily odor.
Foam	When foaming occurs in only a few scattered patches and is less than 3 inches high and cream-colored, it is probably natural. If the foaming is extensive, white in color or greater than 3 inches, it may be due to detergents entering the stream.
Rotten egg odor	Indicates sewage pollution. Odor may also be present in marsh or swampland.
Musky odor	May indicate presence of untreated sewage, livestock waste, algae or other conditions.
White cottony masses on stream bed	Could be "sewage fungus." The presence of this growth indicates sewage or other organic pollution.
Blue-green algae	Could indicate sewage or other pollution if growth is excessive.

HOW & WHERE TO REPORT EVIDENCE OF POLLUTION

The first people to contact when you see evidence of pollution are your local government officials ---- **Conservation Commissions, Boards of Health, Selectmen** and **Town Police**. They can respond most quickly, will know the location and may know something about the condition.

When contacting a local or state agency concerning pollution or fishkills, record the time of the observation and the call, name of person contacted and whether the agency made a verbal commitment to investigate the incident. Give all information available including facts and suspicions on what you suspect caused the pollution or fishkill.

Depending on what you perceive to be the danger, contact the following agencies.

For Sewage, Hazardous Wastes or Oil Spills, call DEP Regional Offices between 8:45 a.m.– 5 p.m. and ask for emergency response.

Northeast Region (Woburn)	(617) 935-2160
Tewksbury	(508) 727-9015
Lawrence	(508) 682-5237
Southeast Region (Lakeville)	(508) 946-2700
Central Region (Worcester)	(508) 792-7650
Western Region (Springfield)	(413) 784-1100

On weekends, holidays and off-duty hours, call (617) 566-4500, the State Police Officer who will relay message to DEP.

For Fishkills, call DFWELE Regional Offices between 8 a.m.–4:30 p.m.

Northeast Wildlife District (Acton)	(508) 263-4347
Southeast Wildlife District (Buzzards Bay)	(508) 759-3406
Central Wildlife District (West Boylston)	(508) 835-3607
Connecticut Valley Wildlife District (Belchertown)	(413) 323-7632
Western Wildlife District (Pittsfield)	(413) 447-9789

On weekends, holidays and off-duty hours, call 1-800-632-8075, Division of Law Environmental Enforcement of FWELE.

For Pesticide Problems, call the Department of Food and Agriculture, Pesticide Bureau, between 8 a.m.– 5 p.m. at (617) 727-3020 x127.

POLLUTION PROFILE/NPDES

Reports, file folders and computer print outs available from federal and state agencies contain important information on the health of your river. Water quality and point source discharge data for your adopted stream can be gathered from the Massachusetts Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (EPA). This information is public and you have guaranteed access to it. This information will turn up problems in need of attention by local river activists that won't be obvious from a walk along the shore. Many toxic pollutants are odorless and colorless. They may be concentrated in bottom sediment or accumulated in fish. Many discharge pipes are below the water surface and away from the shore.

In addition to observations made during a shoreline survey, important information to collect is a summary of basin water quality and whether your river or stream supports its designated best use for drinking, swimming, fishing, or shellfishing. "Appendix III: Basin Segment Information" from the DEP's annual Summary of Water Quality, contains maps of the 32 major drainage basins in the Commonwealth. The associated tables provide a summary of best use classification and identify pollution problems of tributaries and river segments within each watershed. This information will help place your stream in the context of a drainage basin as defined by the state, and familiarize you with the state system of categorizing and standardizing of water information.

The next level of detail for your pollution profile for your stream will come from the river basin plan for the watershed in which your adopted stream is located. The basin plans, prepared by DEP's Division of Water Pollution Control, detail and explain what is summarized in the annual Summary of Water Quality, and is the best place to start for a list of the point source dischargers to your stream. The basin plan may also include a description of non-point pollution sources degrading water quality, as well as information about the compliance of industrial and municipal dischargers with their National Pollutant Discharge Elimination System (NPDES) permits. Unfortunately, all rivers were not sampled regularly so reports may not be available or may be several years old.

If your stream is small, or a discharger is small, they may not have been included in the sampling or review to be incorporated into the Summary of Water Quality or Basin Plan. All point dischargers to surface waters, however small, are required to have a permit, and DEP regional offices (a list appears at the end of this section) will have a record of the small sanitary waste and groundwater dischargers which have permits under the Massachusetts Clean Water Act. This information is located in file folders, and is organized by town or city. These files are located at DEP in Grafton and Boston Compliance/Enforcement Sections.

In some cases a phone call to the regional water engineer at DEP will be all that is necessary to answer your questions. You should be prepared to write a letter requesting access to the files of dischargers to River A, for towns X, Y, & Z. Then you must arrange to visit the regional office and review the files during business hours. You should be prepared to take notes, because you will be charged for copies. Files for dischargers contain detailed technical and water quality information and correspondence that may seem imposing. As you become educated and active in issues of water quality and solving problems, the details of the information in the files will become more important and less mysterious.

EPA Region I currently writes NPDES discharge permits and monitors compliance for all major industrial and sewage treatment plants in the Commonwealth. To obtain a list and copies of the NPDES permits in your watershed, contact the EPA's permit compliance system (617) 565-3511.

Each NPDES permit holder is required to self-sample and test their effluent on a regular basis and report the results to EPA and DEP in "discharge monitoring reports" or "DMRs." A good way to start identifying problem discharges in your watershed is to look at Quarterly Non-Compliance Reports (QNCRs) from EPA. Contact the EPA's NPDES Program Operations Section, (617) 565-3525, for copies of QNCRs and DMRs.

The EPA office in Boston also has extensive files of background information, including permits, engineering and inspection reports as well as compliance records. Again, some information may be obtained over the phone, but be prepared to write a formal request to review files and to visit the office for your review.

When dealing with large federal and state agencies there are two traits to cultivate-politeness and persistence. Persistence is critical, given your need to obtain the information as a basis for your river protection efforts. You have a right to have access to the information and to speak with people who can answer your questions. You may be shuffled by phone by people who are new, or harried, or rude. Maintaining your composure and being polite as well as persistent will pay off when you get through to someone who can help you with your request for information.

The "Annual Water Quality Report Appendix III: Basin Segment Information" and River Basin Plans can best be obtained from:

DEP Division of Water Pollution Control
Technical Services Branch
P.O. Box 116
North Grafton, MA 01536
(508) 792-7470

Individual discharger files can be found in DEP Regional Offices, as well as in Boston and Westborough. In the regional offices, ask for the person in charge of water programs. See page 54 for list of regional offices.

Devise a chart or table to organize the information you've collected. By recording the following key facts, you will have a good reference for locating further information to improve and protect water quality.

Watershed/Basin Name & Number:

Stream Name:

Location: all *towns / cities with frontage and / or in drainage basin*

Stream Classification: *describes use(s) and determines restriction of pollutant discharge*

General water quality problems and sources: note sediment and non*point pollution problems*

Discharger profile:
Facility name and location:

National Pollutant Discharge Elimination (NPDES#)
Type of Discharge: *municipal sanitary wastes; municipal wastes with industrial waste contributions; non-toxic industrial wastes; toxic industrial wastes*

Design flow of treatment facilities: *volume of water and waste plant can treat*

Actual flow of treatment facilities: *measured whenever effluent is* sampled

Pollutants limited by permit:

Effluent monitoring required:

Notes: on *compliance, enforcement, expansion, etc.*

RECOGNIZING AND CONTROLLING EROSION

Erosion of soil from stream banks or other sources can cause serious problems for a stream or waterway. Erosion of sediment into a stream can smother aquatic life and clog the gills of fish as well as cutting off needed light to underwater plants.

Erosion is the process by which beating rain and moving surface water or run off dislodge and carry soil particles, organic matter and plant nutrients as they flow. The texture of the soil and its potential for absorbing water, the steepness of the slope and the adequacy of protective cover on the soil are all factors which influence the extent of erosion. Although erosion is a natural process, an unnatural acceleration of this process may be caused by land-disturbing activities of people.

A gully is easily recognized as evidence of an erosion problem. Unfortunately, not all erosion is as easy to pinpoint. Muddy water is a clear indication that erosion is occurring but it may only be visible for a short time following a rain. However, the damage will continue unless something is done to prevent or reduce it. When erosion is not abated at its source, three to five miles of stream can be seriously degraded with recovery taking 50 years or more.

Oftentimes, in urban, suburban and rural areas, impenetrable surfaces such as pavement, rooftops and compacted soil prevent rain from filtering down into the soil and excess runoff is created. Ask yourself the following questions to determine if erosion is a problem in your stream:

- Is there a buildup of silt in the stream?
- Are the channels of the stream becoming wider and deeper? Are there fallen trees in the stream?

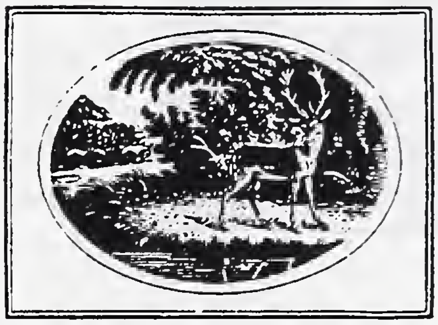
Fortunately there are many things you can do to prevent and minimize the damage caused by erosion. Try some of the following-

- Remove obstructions from your stream.
- Keep people, cars and grazing animals away from the edge of the water.
- Build steps or a ramp between the top and bottom of a bank if you need access to the water.
- Plant protective vegetation on the slopes of the stream banks and on the areas adjacent to the bank.
- Consult a trained engineer about structural sources for controlling erosion. Seek advice from local agencies on available resources.
- Investigate possible sources such as construction sites to see if a lot of sediment is escaping due to inadequate barriers.

Planting trees along streambanks is one of the most effective ways to slow down the process of erosion. Tree roots remove nutrients and sediments harmful to the stream as well as breaking the fall of rain which allows the rain droplets to be absorbed into the soil. The Department of Fisheries, Wildlife and Environmental Law Enforcement, Westborough Office, Fisheries Staff, (617)727-2864, can tell you which trees are most suitable for your stream bank.

With thanks to The Izaak Walton League of America, 1401 Wilson Blvd, L-B, Arlington, VA 22209.

STEP 7: ANALYZE YOUR DATA AND BUILD ACTION PLANS



By now you will have formed a vision of the results of your **Adopt-a-Stream** project; taken inventories of the various resources you have to work with; begun to organize your group into an effective organization; and gathered various types of data and information which will help you determine the scope of problems and the best places to take action.

Now is the time to analyze the data you have, and see how this information indicates what actions your group should undertake to reach your goals.

Utilizing the information you have gathered to formulate an action plan requires not only analysis but also judgment about priorities, political realities, and the capacity of your group and its allies. It is unlikely that the process of analysis and developing an action plan can be done successfully with the whole group. One useful approach is to establish working committees, probably composed of the people who have been involved in gathering the information by topic, and ask each committee to develop a recommended action plan for a specified goal. Before your committees start work, it is useful to have a discussion with the full group to establish some general guidelines. How direct does your group want to be in its approach? Does the group want to focus on education for the public or contact with officials and others involved in specific issues? If you can arrive at a general agreement about your approach, your working committees will be more likely to come back with suggestions which the whole group will feel comfortable with and work on with enthusiasm.

Once committees have a set of recommendations, a presentation should be made to the whole group for discussion, amendment and eventual agreement. It often helps people reach agreement if they realize that whatever plan of action is chosen can be altered if the group finds that it is not achieving the desired results.

Before you begin an action plan you may also want to talk with kindred watershed or river groups, with supportive state agencies, and town officials to get feedback on your plans. But your plan should be your own, so that your group feels it fits your purpose, capabilities and goals for your river or stream.

Examples of how the data you've collected can help determine an action plan goal by goal follow.

EXAMPLE #1

GOAL: Water Quality. Your group has successfully carried out its stream walk and shoreline survey to assess general problems and to observe the status of stream health.

In addition, your group has obtained the applicable DEP (Division of Water Pollution Control) publication for your river, stream or stretch of water. You have reviewed information about the most dominant sources of pollution from DEP's water quality survey data. You may also have information about the type, location and compliance of NPDES permitted discharges into your river or stream from EPA.

You decide which Stream Team Monitoring Projects to do next. Your observations show the following:

1. There is noticeable discoloration of the water at various locations which seems to be related to visible pipe outfalls. This corresponds with the biological survey done in these areas which shows that there are few varieties of insects and primarily those varieties which are tolerant of poor water quality. Farther downstream there appear to be conditions and species consistent with excess organics. There is no visible outfall, but there is a working farm nearby.

2. The DEP data obtained from Water Pollution Control notes problems with industrial pollution in the first sections sampled and indicates agricultural run off in the second area section.

3. The land use information mapped shows that the farm is located in an area zoned for industrial development; and that several new housing units have been constructed nearby.

Your water quality committee assesses these data and makes the following recommendations for action to the whole group:

1. Further investigate the specific sources of outfalls (point sources) noted on the preliminary shoreline survey.

2. Check with DEP (Division of Water Pollution Control) to find out if they have point sources on record or whether you must trace observed outfall pipes to their likely sources.

3. Decide to do further monitoring for chemical or biological and physical conditions.

4. Upon verification of major pollution contributors, (via DEP, field work, town or EPA records), begin systematic process of:
   - contacting contributors and requesting compliance information (specify what would constitute compliance);
   - contacting all related public officials to call attention to the need for compliance (and lack thereof);
   - monitoring sources with regular notification of their compliance: “congratulations” for improvement or achieving compliance; expression of regret and disappointment for continuing non-compliance; and informing the public of the lack of compliance, lack of enforcement, or progress being made using (a) press meetings and b) public work dramatizing water quality problems.

One model for monitoring the compliance of wastewater treatment plants or industries with their NPDES permits was developed by Save The Bay of Rhode Island. The “Good, Bad and Ugly” campaign relies on a simple rating system to determine a dischargers' compliance with selected permit limits: “Good” = 0–2 months of non-compliance, “not-So-Bad” = 3–4 months, “Bad” = 5–9 months, and “Ugly” = 9–12 months. Not intended to “punish” dischargers, it is a powerful tool to raise public awareness and foster problem-solving and long-range planning. Contact Riverways for additional information and a workshop on how to undertake a “Good, Bad and Ugly” survey in your watershed.

5. Assess the need for a physical clean-up and improvements, then (a) plan a clean up (see the **How to Organize a River Clean up Worksheet**, #14), (b) organize constituencies and neighbors to participate;

6. Further investigate probable major sources of indirect or non-point source“ pollution (farm, road salt, golf club, etc.).

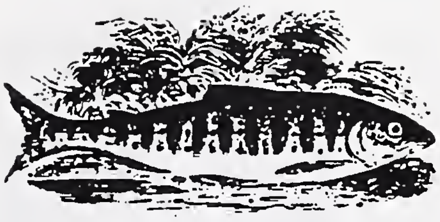
7. Begin systematic contacting of relevant parties, calling their attention to the problem and asking their voluntary cooperation. Try sending an introductory letter; requesting a meeting; meeting to suggest remedies; and periodic follow-up.

EXAMPLES

For a farm: Inform the farmer, encourage alternative methods of fertilizing, grading land to avoid drainage of pesticides, fertilizer of topsoil into the river. (A small buffer zone of plantings along the river could help-land could be donated or granted as an easement; reduction of application could help; integrated pest management could be considered; and careful timing of plowing and applications relevant to water levels and rain fall.)

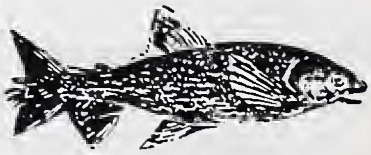
For road salt: Work with the department of public works to reduce the amount of road salt used; change the sand/salt ratio; post the roads; and consider a river buffer zone by law (see land protection section).

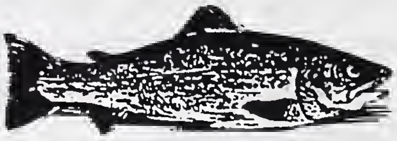
For golf club: Point out problems with fertilizers and herbicides; request reductions in applications; planting of buffer zone; careful timing related to water flows and rainfall.



8. Develop and launch a public information program designed to encourage homeowners and small businesses to:
   - reduce the use and disposal of hazardous materials in septic or sewage systems;
   - take responsibility for reducing the quantity of water used;
   - take responsibility for those habits which contribute most directly to pollution (see the excellent materials produced by the Virginia Chesapeake Bay Program, listed in Resource section and the **Potentially Polluting Practices Worksheet** #9)

9. Request assistance from the Dept. of Fisheries, Wildlife and Environmental Law Enforcement for advice on improving fish habitat along the river. Some debris, for example, may not interfere with canoeing or boating and will provide excellent gathering sites for fish. Factor this sort of information into the planning for river cleanups and get additional fishing enthusiasts involved. (See the **Recognizing & Controlling Erosion Worksheet** #13 for information on stream bed erosion).





HOW TO ORGANIZE A RIVER CLEAN UP

A successful river clean up depends on good organization and enthusiastic participation by the public or members of your group. Good organization will assure that volunteers are used effectively and safely, that the details are attended to, and that the community and general public gains awareness of the river, its condition and potential. Enthusiastic participation will provide the energy to do the physical work of cleaning the river, as well as serve an important public information role through the volunteers.

This checklist summarizes important tasks for organizing a clean up.

☐ Appoint a small working committee, with a strong chairperson or better yet, co-chairs, to coordinate the clean up day. This committee should organize details and find people to take responsibility for key components of the day.

☐ Determine the scope of the clean up. Will you focus on bank trash, water debris, heavy debris or obstruction? How much of the river will you cover? The entire length or just selected portions? How much of adjacent lands will you work on?

☐ Consult with your local Conservation Commission. In order to protect the wetlands, streams and banks, the Wetlands Protection Act (and in some cases, local wetland bylaws) give Conservation Commissions legal jurisdiction over any activity that takes place in the wetlands and streams, stream banks and land within 100 feet from them. You will need their permission for removal of trees, logs and vegetation. In addition, if your clean up requires heavy equipment—trucks, tractors with backhoes—you should discuss with the Conservation Commission how and where you will use them to ensure that your group will not inadvertently damage habitat, wetlands or river banks. Call the Conservation Commission to arrange a time to discuss your plan for the clean up.

☐ Inventory the river area to be cleaned. Take note of the conditions, key sites and other factors which will affect how the cleanup is organized. Keep these points in mind:

- Note the worst and most visible sites. It is useful for community residents to be able to see the activity happening at sites they have probably noted themselves to be bad.

- Utilize input gathered ahead of time from groups (such as sports clubs, garden clubs, conservation commissions) who have an interest in the river. Using this input, prioritize the segments for action. You can assign volunteers to sections as they arrive, saving the least important sections to the end.

- Estimate the time and equipment needed to clean each segment. Small brooks can be cleaned by younger kids (supervised); while sections with higher flows and heavy trash or debris can be worked on by the adult volunteers with large equipment.

- Determine access points for safe use of large equipment if machinery is going to be used.

- Obtain commitments for supplies, materials and equipment needed. Items you may need include:
  - —food for refreshments,
  - —picnic at the end of the clean up
  - —garbage bags
  - —gloves
  - —come-alongs—balloons or other eye-catching decorations along the clean up path
  - —rakes, hoes, ropes
  - —garbage cans or other containers

Many of these items may be donated or loaned from local businesses, town departments or townspeople.

If the site is on private property, you must have permission to go across the land.

☐ Recruit people to help. Invite all sorts of people. Youth groups can be particularly energetic and helpful (try the Boy and Girl Scouts; 4-H Clubs, Future Farmers of America Clubs); also sports clubs, civic clubs or lodges; environmental groups; canoeists; church groups and so forth.

☐ Publicize the event through the town Board of Selectmen; local newspapers; flyers or posters; local radio stations; local cable station; etc.

☐ Alert the town dump or recycling center—be sure you have complied with necessary permits or other arrangements for dumping the refuse you collect.

☐ Make sure there is clear information about where people should meet in the morning; where assignments will be made; where to pick up materials and equipment; when and where refreshments and meals will be served; where to report problems; where to report completion of a section; where to turn in equipment or materials and so forth. Be sure that your coordinating team is clear on its assignments for the day.

☐ Record the names of volunteers so that each person can be thanked. Also all donors should be recorded so that their contributions can be publicized and they can be thanked.

☐ Consider the issue of insurance for accidents; if insurance is not to be provided, public disclaimers should be made through the media and posted on sites.

☐ Be sure you have a complete safety plan including first-aid readily available and well publicized. Safety rules should be publicized and posted. Remember that water can be very cold even in late May and early June. A half day event is often as much as people can handle safely without becoming over tired.

☐ Publicize your event after it is completed—let the community know how successful you were and be sure that all participants are publicly thanked for their contribution.

EXAMPLE #2

GOAL: Land Protection. The members of your group especially interested in land protection have participated in the preliminary stream walk and observed the lands bordering the river. They may have done a more intensive Shoreline Survey. Mapping has provided detailed information on the location of wetlands and other vulnerable sites (such as steep slopes, etc.); the current land uses; the allowable (zoned) uses even if not yet so developed; and the town's conservation lands, none of which are along the liver.

You have also filled out the checklist of local river resource protection measures in your town's bylaws.

This information tells you:

1. A high percentage of vulnerable and biologically valuable wetlands are still zoned industrial, commercial or residential.
2. The major working farm along the river is in an area zoned for industrial development.
3. The current town's planning map shows increased residential construction activity in two areas adjacent to the river where roads providing deeper access to the river already exist.
4. Your town has scored only ''Fair'' on the check list of bylaw or administrative protection for river resources. Seven years ago, you found out, before land pressure was so strong, a wetlands protection zone was voted ''not necessary'' in town meeting.

Your land protection committee recommends to the entire group the following actions:

1. Complete an inventory and composite map of ownership so that you know who owns property along the liver.
2. Meet with the local Conservation Commission, as well as contacting various state and private organizations (land trusts, Fisheries, Wildlife and Environmental Law Enforcement, Conservation Services, etc.) to find out what local actions can be taken to protect parcels.
3. Identify most vulnerable parcels by using criteria such as: age of owner; zoning of property for high-pressure uses (such as residential, industrial); near sites with recent construction; whether owner is absentee and perhaps less aware of town concerns; near roads that encourage construction; rare or endangered species habitat; etc.

4. Contact land owners to explain options for protection including:
    - Conservation easements
    - Donations
    - Purchase (fee simple)
    - Agricultural protection restriction

    (See **Types of Land Protection Techniques Worksheet** #15 for definitions and explanation of types of protection techniques).

5. Contact Department of Fisheries, Wildlife and Environmental Law Enforcement with information about interested sellers, local tax title land, or parcels owned by other agencies who might consider transfer to DFWELE, Department of Environmental Management or similar conservator.

6. Review model bylaws that could be brought to town meeting to strengthen river-front protection. Develop appropriate bylaws for presentation to town meeting. Contact Riverways to set up a Bylaw Workshop.

7. Identify administrative changes which could be made; for example, reducing road salt; enforcing wetlands protection act; exercising health board powers more consistently or *fully.*

8. Provide public information and education on the importance of protection measures to your entire community. Be prepared for some lively debates on property values and owner's rights. Build public support for protection. Offer to send speakers to other towns along the river in order to spread the awareness of the need for action at the local level.

TYPES OF LAND PROTECTION TECHNIQUES WORKSHEET

TECHNIQUE	EFFECT ON LANDOWNER	EFFECT ON PROTECTION GROUP	EFFECT ON COMMUNITY
Fee-Simple: *Outright Purchase*	• Negotiates sale price with buyer. • Pays capital gains tax. • Forfeits control of land.	• Funds depleted by purchase price. • Obtains full ownership and control of property. • Responsible for operations & maintenance (O + M) costs. • Option to provide public access.	• Land removed from tax rolls, but preserved open space places relatively little demand on municipal services (police, fire, schools, etc.) • Adjacent land values may increase. • Potential for public access. • Town is reimbursed through services rendered by the state for Commonwealth-owned lands.
Gifts or Donations	• Receives no income for land transaction. • May have survey, legal, and deed preparation costs. • Eligible for reduced income, property and estate taxes, except Massachusetts income tax. • Pays no capital gains tax. • Forfeits control of land.	• Obtains full ownership and control of land at minimal or no cost. • Option to provide public access. • Responsible for O + M costs. • May share or cover survey and deed preparation costs.	• Same as above.

TECHNIQUE	EFFECT ON LANDOWNER	EFFECT ON PROTECTION GROUP	EFFECT ON COMMUNITY
Bargain Sale	• Receives income, below Fair Market Value (FMV). • Pays reduced capital gains tax. • Eligible for reduced income, property and estate taxes on donated portion of transaction. • Forfeits control of land.	• Obtains full ownership and control of land at reduced cost. • Responsible for O + M costs. • Option to provide public access.	• Same as above.
Less-than-Fee Simple: *Purchase & Resale* *or* *Land Banking*	• Original landowner receives FMV of property, pays capital gains tax and forfeits control of land. • New landowner purchases land encumbered with restrictions and has potential to generate income within limits of allowed uses.	• Overall protection cost is low; however, need initial capital to purchase land. • Forfeit O + M responsibilities once land is resold. • Desired level of protection can be obtained through placement of restrictions prior to resale.	• Land reverts back to private market, therefore remains productive and on tax rolls. • Restrictions result in lower assessment value. • Potential for public access, depending upon restrictions. • Towns may acquire and hold land and resell depending on conditions of purchase.
Purchase & Leaseback	• Original landowner receives FMV of property, pays capital gains tax and forfeits control of land. • Leasee can generate income from land within limits of allowed uses.	• Same as above except potential exists for profits from leasing of land. • Non-profit protection groups may be required to pay property taxes if land is leased	• Local communities may generate enough lease revenues to offset loss of property tax revenues. • Potential for public access, depending upon restrictions.

Long-Term Lease	• Retains control and ownership of land. • Responsible for O + M costs. • Any economic gain is taxable.	• Inexpensive means of obtaining protection and/or public access. • No control over use of land.	• Land remains on tax rolls. • Potential for public access.
Land Restrictions:			
Easements & Conservation Restrictions	• Receives income for FMV of easements, if sold, and assessed capital gains tax. • Receives tax benefits, if donated. • May have land survey, legal and deed preparation costs. • Experiences reduced property and estate taxes. • Maintains ownership and control of land.	• Obtains protection and/or public access at reduced cost. • Difficulty in determining value of easement. • O + M responsibilities depend upon negotiated agreement. • May share survey, legal, and deed preparation costs.	• Land remains on tax roll but at reduced assessment value. • Potential for public access. • Town Conservation Commission may hold CR's and be responsible for monitoring.
Agricultural Preservation Restriction Program	• Receives income from State for forfeit of development rights and assessed capital gains tax. • Pays lower property tax. • Maintains ownership, control and current agricultural use of land. • Restriction recorded in perpetuity.	• Protection obtained at no direct cost. • No control over use of land. • Not responsible for O + M costs.	• Land remains on tax roll but at reduced assessment value; no requirement for public access.

TECHNIQUE	EFFECT ON LANDOWNER	EFFECT ON PROTECTION GROUP	EFFECT ON COMMUNITY
Transfer of Development Rights	• Receives income for loss of development in protected area.	• No cost; protection cost is borne by private developers.	• No expense to town for land acquisition. • Allows economic benefits for one development while protecting natural resources. • May permit intensive development in specified areas. • May specify use of tax revenue from such new development.
Subdivision Regulations	• Retains ownership, control and ability to develop land. • Development subject to regulation process.	• River corridor protection not guaranteed.	• Land assessed at higher value due to improvements. • No requirement for public access. • Opportunity to shape configuration of subdivision to protect river and stream corridors.
Wetland Protection Programs	• Retains ownership of land; however, use restrictions exist. • Pays reduced property taxes.	• Protection obtained at no direct cost. • No control over land.	• Land remains on tax rolls, but at reduced assessment value. • No public access.
Tax Incentive Programs: *Chapter 61 Forestry* *61A Agriculture* *61B Recreation*	• Pays lower property taxes. • Management Plan required by 61 & 61A. • Maintains ownership, control and current use of land. • Pays penalty taxes if withdrawing or fails to comply with management plan.	• Limited and potentially short-term protection achieved at no direct cost. • No control over use of land.	• Land remains on tax rolls but at reduced assessment value. • No requirement for public access (except for recreation land).

Government Regulatory Programs: *Floodplain* *Cluster Zoning*	• Floodplain zoning places restrictions on land or prohibits development. • Cluster zoning allows landowner to develop land at traditional density while leaving river corridor undeveloped. • Pays reduced property taxes, if land is restricted.	• Protection obtained at no direct cost. • No control over use of land, unless land protected through the clustering process is deeded to local community protection group.	• Restricted land assessed at lower value. • No public access, unless land deeded to local community **or** protection group under cluster concept.
Local river protection overlay district bylaws	• New development must be set back a certain distance from the water's edge • Activities beyond the set back line are unaffected	• Protection obtained at no direct cost • Need to educate townspeople and push for adoption at town meeting • Need to watchdog landowners for violations and town for effective enforcement	• Negligible tax impact • No public access although option preserved for negotiating access at future date • Need to enforce bylaw and grant variances in hardship situations

STEP 8: KEEPING YOUR ORGANIZATION STRONG.

These model action plans are ambitious. The work described could take the average group not one year, but several years.

To carry out the Action Plan your group actually develops, you will need a strong, resilient group which is large enough to carry out the tasks connected to a comprehensive plan.

Building a strong group is not accidental, or even necessarily natural. It takes awareness, thought and work. But investment in your group's strength and growth will pay off handsomely over the years.

Remember that every group goes through stages: early struggles; success and growth; maturity and maintenance; and, sometimes, demise. You may not realize when your group is moving from one stage to another, but you will feel the pressure. It is often surprisingly helpful simply to recognize you are in a transition-sometimes ideas for improvements and changes will occur at that point. It is also important to realize that people have different skills and strengths. The person who was super as an organizer and "do-it-all" type in the early stages, may not be an effective administrator in later stages. The Board which launched the group may not have all the skills to carry it into a more mature and sophisticated stage. These changes are NATURAL and need to be prepared for and taken in stride, not viewed as trauma. A strong group needs all its members; a wise group will assess roles periodically to test the best fit of skills to needs.

Here are some pointers for keeping your group alive and strong and effective.

Outreach and diversity:

To be effective a group needs to keep growing. A good way to build a strong base is to reach out to groups who have a natural common interest in the river, even if river preservation is not the first priority. This means fishing and hunting clubs, canoe groups, conservation and outdoors groups, youth and civic groups, science teachers and students, environmentalists, etc. Invite them to be organizational members, to lend their memberships for major activities, to cosponsor events.

Remember: the greater the diversity of your group, the greater skill at keeping the group focused on its common agenda will be needed. The payoff can be greater strength, numbers and perspective on issues.

Good leadership

Good leaders are developed, not born. A dominant or vocal or sprightly personality may not be the best leader. Leadership requires a strong sense of self (but not a self-centered character); the ability to articulate the group's goals and the related tasks without personal bias; the ability to organize people into effective work groups; the ability to track assignments, inspire participation and encourage long-term commitment. A leader first of all understands other people and knows how to keep them involved and moving.

Leaders or potential leaders are in every group. They may not always be the people you notice at first glance. Pay attention to who helps clarify, facilitate, assign, review, sort and articulate. Who seems to help other people get their points across clearly? Encourage these people to try ”leadership“ roles in a small way. As confidence and comfort grow, so, usually, does willingness to take on more work. Try rotating some leadership responsibilities or sharing through ”Co-chairing“ or other partnerships. It is tremendously helpful for a group to have a number of people able to provide leadership in a variety of ways, not just one leader for all purposes.

Run Good Meetings

There are some very specific tips which will help your group run good meetings that get things done, provide satisfaction and keep people involved. Try these methods:

- Make sure there is a clear agenda, with specific time allotments for each item, and a clear idea of the outcome you are seeking for each item-decision, information sharing, discussion only, or referral to committee or working group.

- Have participants sit in a circle or semi-circle so that each person can see all the others. The Chair will have an easier time, everyone will feel more of a participant, and you will generally have a greater sense of cohesion.

- Review the agenda at the beginning of the meeting to clarify expectations; set aside a small amount of time for addition of forgotten items, suggestions for changes, etc.

- Have a timekeeper for the meeting (often it is useful to have this be someone other than the Chair so that the Chair can concentrate fully on the discussion). Stick to the agenda and times set. If it appears that you need more time for an item, call a time check and ask the group for agreement about whether to extend the time, table discussion or make a decision. If at all possible, the Chair should remind the group of its time limits a few minutes before actual time is up to minimize pressure on decisions and discussion.

- Encourage everyone to speak. In the case of committee reports, the spokesperson chosen by the committee should present information. When there is a need for clarification or discussion, the Chair should encourage people to speak up. However, the Chair needs to be prepared to point out when one person has taken more than a fair allotment of time. Setting a time limit on discussion at the outset encourages people to make their points; a good Chair can help people be succinct.

- The Chair should review points that have been made. By summing up the Chair can facilitate understanding and speed up the overall process.

- The Chair should help discussion achieve resolution if that is the desired outcome. This can be done by formulating points for decisions, helping the group to see the alternatives which have been put forward during discussion, and clarifying just what decision is being made at any given point. Often resolution can be accomplished through a "sense of the group." If there is significant disagreement or confusion, it may be wise to call a vote.

- Notes should be taken at all meetings and clarification should be made at the moment as necessary to avoid confusion after the fact. If a task is assigned and given a time frame, this should be noted.

- Tasks should be made in the most specific way possible; a person should be assigned to a task; a time-frame should be given.

- Set your next meeting at the end of each meeting session. Thank people for attending, express appreciation for their work. Agree on a process for notifying everyone, particularly people who could not attend this meeting.

Keeping volunteers involved and coming back

Volunteers are the backbone of most non-profit activist groups.

You need to treat them carefully. Volunteers can take a lot of supervision since their time is intermittent and their work must be "patchworked" together into the whole quilt of your action plan. Here are some suggestions for making the most effective use of your volunteers:

- Know their skills (use the **People Resources Worksheet**)

- Fit tasks to skills if possible.

- Provide clear instructions and supervision if needed to avoid confusion or having to redo tasks

- Make tasks self-contained, if possible, so that supervisors do not have to try to figure out where the last volunteer left off and the new person is to begin.

- Help volunteers understand how their tasks, however small, fit into the whole picture of your action plan; even drudgery tasks can take on importance if placed in context.

- Thank volunteers, invite them back, provide public recognition whenever possible.

- Put people to work in teams whenever possible to add a social dimension to work-some great friends can be made through this sort of community work.

Public involvement

Ultimately the protection of a river or stream will depend on the public support for the goal of protection. The best way to generate public support is to get the public involved. Here are some ways to increase public involvement and support for your work:

- Ask for support from a broad sector of your community; ask businesses to donate garbage bags for clean ups, computer time, hot dogs and soda for a festival, printing or photocopying, etc. Fit the request to the business's own products: if appropriate you might encourage donors to put their logo on donated products to give them public recognition and to demonstrate wide-spread support for your work.

- Schedule regular visits to public officials such as planning board, conservation commission or health board, business leaders, and even the Chief Executive Officers of companies headquartered outside your region (by mail if more practical). At a minimum send these contacts a letter introducing your organization and a regular copy of your newsletter.

- Invite the public periodically to enjoy the river and participate directly in its protection and improvement

- through clean-up days, festivals, canoe races, fishing contests, and any other means you can devise. The more people use their river the more likely they are to support efforts to protect it.

Public Relations

As good water quality depends upon sound land use decisions in the surrounding watershed, it is important to build an informed constituency for your river or stream through the media. Keep the community at large abreast of your group's workshops, cleanups, canoe trips, meetings, shoreline surveys and monitoring activities through local, regional or state print and television media. Increased public awareness can affect decision-making by individuals in the home and the community as a whole, from water conservation and use of alternative household cleaners to zoning, bylaws or sewer project funding.

- Establish an outreach or publicity committee and identify a network of people that will be willing to write letters to the editor and press releases or make telephone calls.
- Identify media outlets and make a contact list, complete with telephone and fax numbers, of: newspapers (daily, weekly), radio and TV stations, wire services, community organization newsletters (clubs, civic groups), environmental and public interest groups, membership of your group, select individuals (elected officials, community leaders).
- Find out the procedures for submitting letters to the editor, editorials, weekly columns, public service announcements, press releases, and community calendars. Know when the daily and weekly newspapers and newsletters go to press.
- Get to know the reporters that cover your area; begin with an informal get-acquainted session to introduce your group and its goals. Over time, you may be called upon regularly for story topics or for quotes on community issues. Remember, it is a mutually beneficial arrangement: you need publicity for your river or stream and reporters need interesting stories.

Often, the most accessible and useful means of communicating your efforts and ideas to the general public is through letters to the editor. However, as your group becomes established, you will want to issue "advances" for planned events and press releases for important activities.

Press releases should be brief, one or two pages, and double-spaced. Headlines should be simple and eye-catching. In the first paragraph, state clearly what is happening, who is doing it, when and where its taking place and the purpose of the project. A follow-up paragraph containing quotes from your group will liven the release. At the end, give a brief description of your group and its purpose. Print it on official group stationery and, in the upper right corner, be sure to include the name and number of a primary contact person.

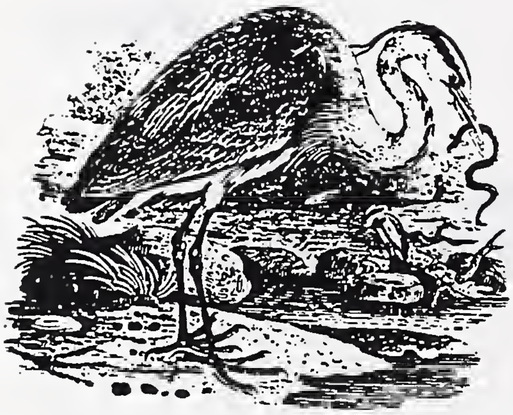
Contact the Riverways office for an informational packet on writing press releases and handling interviews.

Sound Finances

There are two crucial dimensions of sound finances: (1) fundraising, and (2) financial management. Often they are handled separately by a fundraising committee and treasurer, respectively. But they must be viewed together for sound overall financial planning. You must have an idea of what you need to finance in order to plan how (and how much) to fund raise. You must have a good guess about how much you can raise before you commit yourself to costly plans. Be sure your key financial people or committees meet together periodically and get the input of the full board often enough to avoid financial confusion.

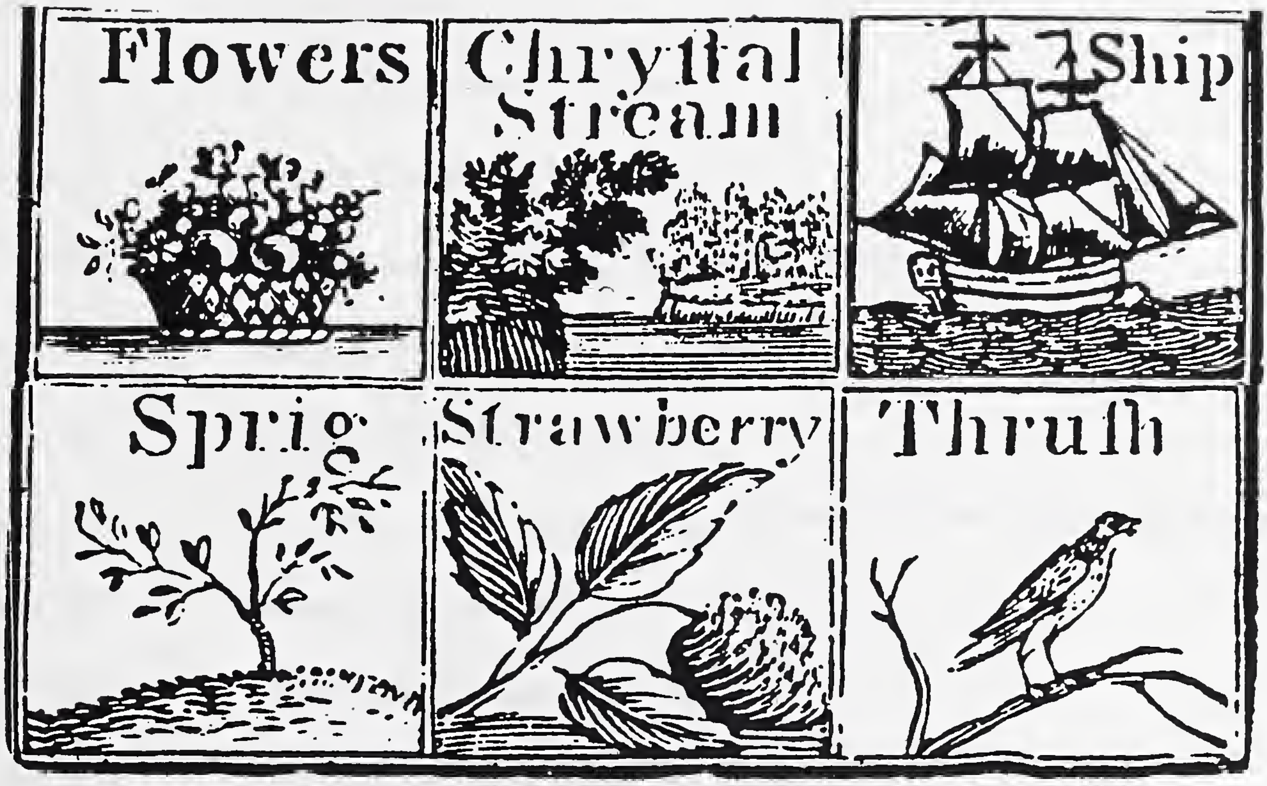
Some suggestions:

- Make your fundraising plans modest to begin with.
- Look for ”in-kind“ donations, that is, materials or services provided directly by the donor rather than cash.
- Don't feel uneasy about asking people for funds-remember that you are offering them a chance to participate in important work; some people have time to contribute, some have money. It's a fair trade.



- Be specific about how much you need and why. People are some times more likely to donate money if they know what it will be used for; but remember that you must use the money the way you say you will!
- A ”no“ from a potential donor does not mean that they dislike you, dislike the project, or will never give again. Be sure that you have answered all the questions a donor may have, and if appropriate, indicate that you will ask again when another need arises.
- Be sure that financial supporters receive recognition in the community. Some donors, however, may wish to be less visible; be sure you check before you publicize someone's gift. In the cases where public recognition is not desired, be sure that your organization provides private thanks.
- Try to keep donors apprised of the outcome of their support-provide periodic information about how their donation has been used. This may increase the chance that they will give again.
- Look for ways to build in steady, low-level support from many sources-a pledge system may work, charter members, annual gifts, etc. Be sure that you do not rely too much on any one source of funds such as grants or private donors. A broader financial base is stronger.
- Research sources of federal, state and local funds, including grant programs, foundations, contracts, etc. Be sure you fully understand the terms and conditions of each source. Special demands or restrictions on some sources of funds may make them more trouble than they are worth.
- There are some excellent sources of information about fundraising for non profit groups. See Resources List in appendices for suggestions.

PART III



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Resources

The Riverways library at the Department of Fisheries, Wildlife & Environmental Law Enforcement, Room 1901, 100 Cambridge Street, serves as a clearinghouse for river related information. The following is a sampling of materials available.

Organizing

A Citizen's Guide to River Conservation. R. Diamant, J.R. Eugster, and C.J. Duerksen. The Conservation Law Foundation, Washington, DC. 1984.

"Bay Watchers Volunteer Survey," Chesapeake Bay Foundation, 162 Prince George Street, Annapolis, Maryland, 21401.

Winning Local & State Elections: The Guide to Organizing Your Campaign. Ann Beaudry & Bob Schaeffer, Free Press, Macmillan, Inc. N.Y., 1986.

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"A Canoe Guide to the Housatonic River, Berkshire County," Housatonic River Watershed Association & Berkshire County Regional Planning Commission, 5 Westminster Road, Lenox, MA 01240.

"Canoeing Map of the Ipswich River," Ipswich River Watershed Association, Inc., 87 Perkins Row, Topsfield, MA 01937.

"Charles River Canoe Guide," Charles River Watershed Association, Auburndale, MA 02166.

"The Complete Boating Guide to the Connecticut River," Connecticut River Watershed Council, Inc., 125 Combs Road., Easthampton, CT 01027.

"The Nashua River Canoe Guide," Nashua River Watershed, 609 Massachusetts Avenue, Lunenburg, MA 01462.

"Public Access to the Waters of Massachusetts," Public Access Board, 100 Nashua Street, Boston, MA 02114.

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The Charles River: Exploring Nature and History on Foot and by Canoe. Ron McAdow, Bliss Publishing Co., Inc., Marlborough, MA. 1992.

HOW TO ADOPT A STREAM

Do you have a raging river of pollution going through your town, or fishing spot on a river that seems lacking in the usual abundance of fish species, or a stream that you fear will be changed drastically from its quiet meanderings by a nearby proposed development, or a favorite stretch of stream or river that has always been a place for quiet reflection?

The **Adopt-A-Stream Program** of the Department of Fisheries, Wildlife and Environmental Law Enforcement can provide help to interested citizens who want to take action to preserve or improve the quality of the river or stream nearby and its supportive ecosystem.

These steps outline how you can Adopt-A-Stream:

1. Contact the Adopt-A-Stream (AAS) Coordinator, Riverways Programs, Department of Fisheries & Wildlife, 100 Cambridge Street, Room 1901, Boston, MA 02202, (617) 727-1614 X 384.

2. Fill out these forms requesting information about your stream, your organization and your concerns. Make copies and return the Organizational Inventory, the Stream Survey, the River and Watershed Contact list.

3. Call the AAS Coordinator to discuss your concerns and ways to work together.

4. Schedule an on-site visit for us and/or a meeting with key people in your organization. As appropriate, we will arrange for fish and wildlife biologists, water quality specialists, or land management experts to evaluate the condition of your stream and its banks.

5. Develop a preliminary action plan to address river issues using us as consultants as needed. Work with AAS staff to develop a scope of agreement which describes your action plan for addressing river issues.

6. Determine with the AAS staff what level and type of service you can best use and who can best provide assistance to implement your action plan.

7. Receive Adopt-A-Stream designation and use Riverways support for an action plan, for citizen education or for organizational activities. Organize a time, place and event to receive your AAS certificate. Invite the press, local officials, other environmental and civic groups, the local watershed association and state representatives and senators to the event. We will make the presentation and help you celebrate the adoption.

It may be that you do not have an organization and need help getting started. Or it may be that some other state agency should also be involved in helping you. Our goal is to work with you to understand each situation and find the method of stream and ecosystem protection most likely to be successful. Call us.

ORGANIZATIONAL INVENTORY

This inventory is for groups interested in joining the Department of Fisheries, Wildlife and Environmental Law Enforcement's **Adopt-A-Stream Program** to encourage local actions to protect river ecosystems. Once part of the program, adopting organizations will be issued a certificate of participation and obtain access to **Adopt-A-Stream Program** resources.

Please fill this form out and return it to Joan C. Kimball, **Adopt-A-Stream Program** Coordinator, Department of Fisheries, Wildlife and Environmental Law Enforcement, Room 1901, 100 Cambridge Street, Boston, MA 02202. This information will help us evaluate your needs and ways we may work together.

Name of organization: ______________________________

Address: ______________________________

Phone Number: (   ) ______________ Contact Person: ______________

Date: ______________ Phone (if different) ______________

Watershed: ______________________________

Stream or Specific Segment to be adopted: ______________________________

Segment begins (street/town): ______________ and runs _____ miles through (sections of city/town in immediate area): ______________ and ends (street/town):

______________________________.

How long has the organization been in existence? ______________________________

How frequently does it meet? ______________________________

Membership: (total) ______________ (Active) ______________ Mailing list? __________

Funding sources: (dues) ______________ (grants) ______________ (state/other) __________

Staff? (paid) ______________ (volunteer) ______________ (number of people) __________

Is your organization incorporated? _____ Is it tax-exempt (501 c3)? _____

What other local groups are interested in protecting the stream? ______________________________

Newspaper(s) (and its/their phone number(s)) in your town: ______________________________

____

____

Adopt a Stream ______________________________

ISSUES OF GREATEST CONCERN

Number 1 to 11 in order of concern to your group, with 1 being the most important.

_____ Point source pollution (wastewater treatment plants, industries, etc.)

_____ Non-point source pollution (agricultural runoff, erosion, urban runoff, septage systems, etc.)

_____ Riverfront land acquisition, conservation easements

_____ Wildlife habitat and management

_____ Fisheries habitat and management

_____ Open Space/recreation/access

_____ Local regulations or bylaw protection of water and open space resources

_____ Public information and education about watershed resource issues

_____ Water supply or conservation

_____ River diversion

_____ Other (please describe) ____

____

Greatest Organizational Needs

_____ Understanding state or federal government systems related to water supply and rivers

_____ Understanding local government options for protecting waterways

_____ Mapping land uses/ownership/habitat/water resource areas, etc.

_____ Use of media

_____ Running good meetings and a strong organization

_____ Educating the public; involving the public

_____ Finding funds

_____ Other (specify) ____

____

What specific projects do you have in mind for protecting the stream or river you want to adopt?

____

____

____

Adopt a Stream

STREAM SURVEY for the ________________ River

Geographic Data: Date: ____________

Watershed name: ______________________ USGS Quadrangle map(s) ____________

Area of Watershed ______________________ Approximate length of river ____________

Source (in town of): __________ Confluence (with river) __________ in town of ____________

Towns in watershed: ____

____

MAJOR TRIBUTARIES & STREAMS

Name	Approx. length	Source (begins in)	Joins (with/at)

PROTECTED RIVER LANDS: PARKS, SANCTUARIES ETC. along rivers in basin:

Name	Approx. acreage	Location	Ownership

YOUR SPECIFIC LAND PROTECTION/LAND USE CONCERNS

WATER QUALITY DATA: # Towns on Septic Systems _____ # towns sewered _____
*Wastewater treatment plants information:

Name	Town	Avg. flow (MGD)*	Capacity	Notes

**MGD (million gallons per day)*

YOUR SPECIFIC WATER QUALITY/QUANTITY CONCERNS

Data collected by: __________________________

Much of this information can be found in "Annual Water Quality Report, Appendix III: "Basin Segment Information" available from DEP, WPC, Technical Services Branch, Grafton, MA 01519 (508)792-7470.

RIVER & WATERSHED CONTACTS

DATE: ______________

RIVER: ______________________________ WATERSHED: ______________________________

Write in the name of the contact person, address and phone number for each of the groups listed below.

LOCAL ENVIRONMENTAL ORGANIZATIONS

HUNTING/FISHING ASSOCIATIONS

LAND TRUSTS

LOCAL OFFICIALS

Conservation Commission ______________________________

Planning Board ______________________________

Recreation and Parks ______________________________

Economic Development ______________________________

Selectmen/City Council ______________________________

Board of Health ______________________________

LEGISLATORS

MA Representative(s) ______________________________

MA Senator ______________________________
US Congressman ______________________________
US Senators ______________________________

PRESS *(newspapers/radio stations/local cable television stations)*

STATE AGENCIES

Department of Fisheries, Wildlife & Environmental Law Enforcement

- Riverways/Adopt-A-Stream Program (617) 727-1614 x384
- Central Wildlife Dist. (508) 835-3607
- Conn.Valley Wildlife Dist. (413) 323-7632
- Western Wildlife Dist. (413) 447-9789
- Northeast Wildlife Dist. (508) 263-4347
- Southeast Wildlife Dist. (508) 759-3406

Department of Environmental Protection

- Technical Services Branch, Grafton, MA (508) 792-7470
- Northeast Region (617) 727-5194
- Southeast Region (508) 947-1231
- Central Region (508) 792-7653
- Western Region (413) 785-5327